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12 April 1982

Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

No. 211

FBIS FOREIGN BROADCAST INFORMATION SERVICE

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MANY BENEFITS OF SHAMSHAD SATELLITE STATION LAUDED

Kabul KABUL NEW TIMES in English 13 Mar 82 p 3

[Text]

Since its inception the television of the Democratic Republic of Afghanistan has been making persistent and untiring efforts to improve its programme and make it worthy media of entertainment as well as education.

With the commissioning of the "Shamshad" satellite land station, installed through disinterested grant of the friendly country of the Soviet Union, the DRA television will be able to transmit its programmes outside the country and receive the outside programmes of those countries with whom the DRA has already concluded agreements.

The above was stated by Abdulah Shadan, president of the DRA Television during an interview with the reporter of the Kabul New Times.

Further expounding on the "Shamshad" station, Shadan added: Through this station we will be able to receive the Moscow TV programme, the member countries of Council of Mutual Economic Cooperation, as well as member counttries of the International Sputnik System, to membership of which the DRA entered a while ago.

It ought to be noted that with the exception of regular programmes of Moscow TV which "we can always make use of it in Kabul, receiving of other countries' TV programms is subject to the approval of concerned TV departments related to the International Inter-sputnink Union, the headquarters of which is located in Moscow.

The Moscow TV beams its programmes at various channles and at different hours. The DRA television can receive the Moscow TV programmes from 8 a.m. until 12 p.m. Afghan standard time. Other countries can also receive the DRA television programmes through the "Shamshad" station.

The President of the DRA Television further said: "With further development and expansion of the DRA television, a qualitative change will be brought about in its programmes."

A concerned source of the Ministry of Communications, talking about the technical aspects of the "Shamshad" station said: "The station has 12 international telephone channel and one charged for local telephone service. Its international telephone channels can be expanded up to 24. The "Shamshad" station will also offer telegraph, telex, teleprinter and telephoto services in a better way.

With the commissioning of the new station added facilities are provided in communications affairs in the country. The DRA has now established better communication link with members of the Inter-sputnik system.

The technical equipment and other accessories of the "Shamshad" station is supplied to Afghanistan as grant-in-aid by the friendly country of the Soviet Union and the total value of the station amounts to seven million roubles.

The DRA Communications Ministry has spent six million afghanis for the building in which the station is housed. An additional five million afghanis is planned to be spent on building the adminstration unit of the station.

The Soviet experts have helped in installation of the station and six Soviet experts will continue to assist the Afghan experts in operating the station, the source added.

CSO: 5500/5338

SATELLITES AID COMPUTER MAPPING INFORMATION ADVANCES

Brisbane THE COURIER-MAIL in English 2 Feb 82 p 31

[Article by Bill Hewitt]

[Text] The State Government mapping authority has taken a fresh look at a very familiar subject — the map of Queensland.

The Mapping and Surveying Department has introduced Sunmap, to promote greater public awareness of the value to Queensland of up-to-date mapping information.

The Sunmap logo is part of a major new marketing initiative.

The department's map shops in Brisbane, Bundaberg, Maryborough, Rockhampton, Roma and Toowoomba have been renamed Sunmap centres.

The change will also see the introduction of the Sunmap aerial photography centre at Watkins Place in Brisbane.

The centre, which stocks a complete aerial photographic and satellite record of the state for public and government use, is very much the "eyes" of Queensland.

Without the up-to-date mapping information available at the centres, many of the state's development projects would simply not be possible.

The department is keeping pace with these projects with an impressive land information system consisting of more than 4000 maps, about three million aerial photographs and masses of survey data.

The last two years has seen the addition of satellite imagery taken 900 kms over Queensland by the United States earth resources satellite LANDSAT.

The data, beamed to the Australian LANDSAT station at Alice Springs, is available within days from the department.

Satellites of another kind are also playing a part in the challenge.

The principle of navigation by satellite, used by ships travelling the world's oceans, is now being applied to surveying in Queensland.

Signals sent from American-built NAVSAT satellites allow Queensland surveyors to pin-point ground positions accurately to within a metre.

The state is expected to benefit greatly in the near future from another technological breakthrough — the airborne laser depth sounder.

The Australian-designed laser, which has undergone trials in Queensland, allows mapmakers to record the ocean's depths from an aircraft flying overhead.

The laser depth sounder is certain to be of great significance in the mapping of Queensland's reef waters — a task which on present estimates is expected to take many years to complete.

The computer, responsible for so many of today's advances in commerce and industry, is also making its presence felt in mapping.

The foundations are presently being laid in Queensland for a land information system based on the computer storage and retrieval of mapping data.

This will allow an engineer or town planner in the future to obtain mapping data straight from a computer screen or printout.

In certain instances, this could mean that the printed map, as we know it, will no longer be necessary.

Armed with the latest technology, the state's mapping authority is now tackling projects in a time span deemed impossible a few years ago.

These are but a few examples.

Work is well advanced on the complete re-mapping of Brisbane by 1983.

The accuracy and clarity of the new photo maps have made them an ideal tool for engineers, surveyors, town planners and city administrators.

CSO: 5500/7525

BRIEFS

ILLEGAL TRANSMITTER CRACKDOWN--The Federal Government is to crack down on the illegal use of radio transmitters. At least $500,000 in government revenue has been avoided by owners of transmitting equipment failing to take out proper licences. The Minister for Communications, Mr Sinclair, said in Canberra yesterday there was increasing concern over what he called a serious problem of unlicensed radio equipment. Its use often caused interference to legitimate transmitters as did the illegal modification of equipment to allow more channels or excessive power, Mr Sinclair said. Fee evasion was another worry because it threw an increasing burden on to legitimate users who paid their fees and operated equipment responsibly. "What these fee evaders are doing is penalising their fellow Australians by causing steeper fee rises than would probably be the case if all users took out licences," he said. The worst offenders had been owners of fishing boats, small craft, delivery van drivers and trucks in Queensland and departmental officers would launch their campaign there. [Text] [Canberra THE AUSTRALIAN in English 4 Feb 82 p 4]

CHINESE BROADCASTING DELEGATION--A delegation from China's central broadcasting administration has urged closer cooperation between television and radio services in China and Australia. The delegation is in Tasmania as part of the first Australian tour by a Chinese broadcasting delegation. The administration's director, Zhang Xiangshan, has said his organization and the Australian Broadcasting Commission [ABC] face similar problems like a shortage of funds. Radio Australia is the overseas service of the ABC. [Text] [BK120655 Melbourne Overseas Service in English 0500 GMT 11 Mar 82 BK]

CSO: 5500/5733

COMMUNICATIONS MINISTER TELLS SATELLITE PLANS

Bombay THE TIMES OF INDIA in English 10 Mar 82 p 13

[Text] New Delhi, March 9 (PTI)--The government has sanctioned a Rs. 188-crore project to provide domestic communication links through satellites, the communications minister, Mr C.M. Stephen, told the Lok Sabha today.

The project provided for two satellites and 31 earth stations, he said, in a written reply to Dr Saradish Roy and Mr Gadadhar Saha.

He said the first of the satellites--Indian National Satellite (INSAT I-A) was likely to be operational in May 1982. To work with INSAT I-A, the P and T department had been constructing 28 fixed earth stations at Calcutta, Delhi, Madras, Bombay, Shillong, Jaipur, Lucknow, Jullundur, Patna, Bhubaneswar, Hyderabad, Ahmedabad, Ernakulam, Srinagar, Jodhpur, Bhuj, Panaji, Minicoy, Gangtok, Itinagar, Kohima, Imphal, Agatala, Leh, Port Blair, Aizawl, Kavaratti and Car Nicobar.

Mr Stephen said three transportable earth stations would be provided for communications in case of emergency. The second satellite (INSAT 1-B) was proposed to be launched in mid-1983.

The expected life of the satellite was seven years, the minister said.

More TV relay stations: The information and broadcasting minister, Mr Vasant Sathe, told the house that the government was considering the establishment of more Doordarshan relay stations as well as low-power transmission stations.

He said in reply to a question by Mr Digamber Singh that this was, however, subject to the availability of resources and to the telecommunication microwave system being adjusted to television.

In reply to the main question he said TV relay centres were proposed in the Kasauli (H.P.) and Kodaikanal (Tamil Nadu) hilly areas during the sixth plan.

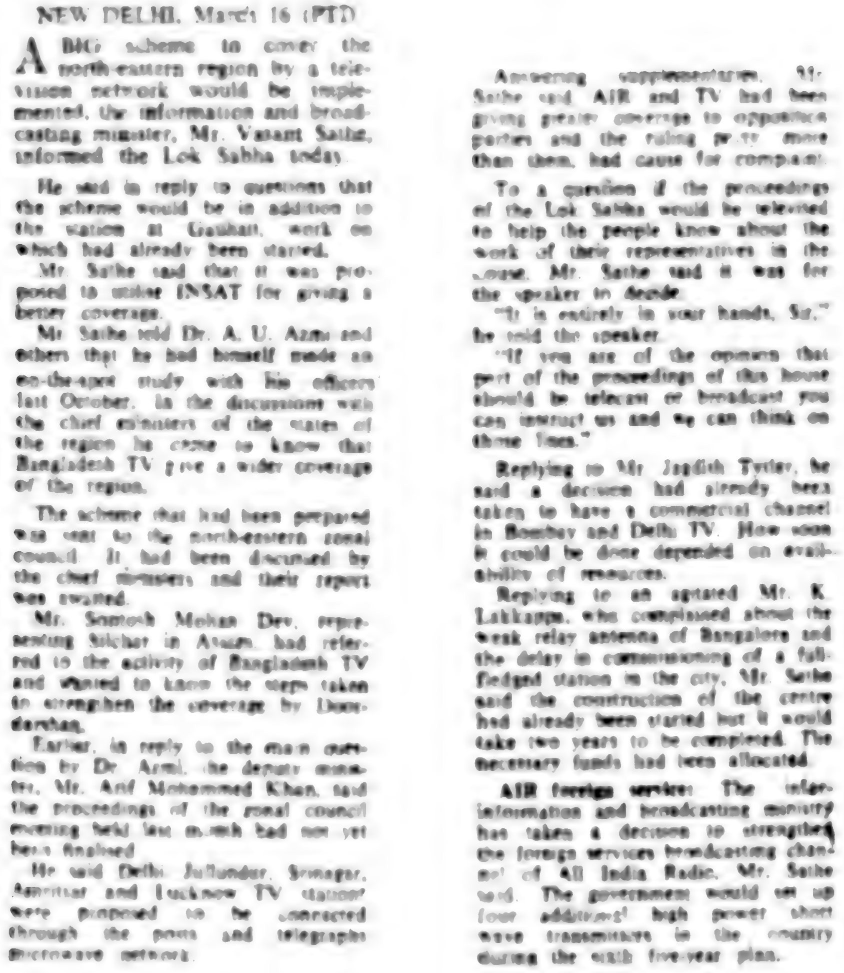
In the northeastern region the setting up of a number of low-power transmitters was also under consideration, he said.

CSO: 5500/7096

INFORMATION MINISTER TELLS BROADCASTING, TV PLANS

Bombay THE TIMES OF INDIA in English 17 Mar 82 p 17

[Text]



NEW DELHI, March 16 (PTI)

A BIG scheme to cover the north-eastern region by a television network would be implemented, the information and broadcasting minister, Mr. Vasant Sathe, informed the Lok Sabha today.

He said in reply to questions that the scheme would be in addition to the station at Gauhati, work on which had already been started.

Mr. Sathe said that it was proposed to utilise INSAT for giving a better coverage.

Mr. Sathe told Dr. A. U. Azmi and others that he had himself made an on-the-spot study with his officers last October. In the discussions with the chief ministers of the states of the region he came to know that Bangladesh TV gave a wider coverage of the region.

The scheme that had been prepared was sent to the north-eastern zonal council. It had been discussed by the chief ministers and their report was awaited.

Mr. Santosh Mohan Dev, representing Silchar in Assam, had referred to the activity of Bangladesh TV and wanted to know the steps taken to strengthen the coverage by Doordarshan.

Earlier, in reply to the main question by Dr. Azmi, the deputy minister, Mr. Arif Mohammed Khan, said the proceedings of the zonal council meeting held last month had not yet been finalised.

He said Delhi, Jullundur, Srinagar, Amritsar and Lucknow TV stations were proposed to be connected through the posts and telegraphs microwave network.

Answering supplementaries, Mr. Sathe said AIR and TV had been giving greater coverage to opposition parties and the ruling party, more than them, had cause for complaint.

To a question if the proceedings of the Lok Sabha would be televised to help the people know about the work of their representatives in the House, Mr. Sathe said it was for the speaker to decide.

"It is entirely in your hands, Sir," he told the speaker.

"If you are of the opinion that part of the proceedings of this house should be telecast or broadcast you can instruct us and we can think on those lines."

Replying to Mr. Jagdish Tytler, he said a decision had already been taken to have a commercial channel in Bombay and Delhi TV. How soon it could be done depended on availability of resources.

Replying to an agitated Mr. K. Lakkappa, who complained about the weak relay antenna of Bangalore and the delay in commissioning of a full-fledged station in the city, Mr. Sathe said the construction of the centre had already been started but it would take two years to be completed. The necessary funds had been allocated.

AIR foreign service: The information and broadcasting ministry has taken a decision to strengthen the foreign services broadcasting channel of All India Radio, Mr. Sathe said. The government would set up four additional high power short wave transmitters in the country during the sixth five-year plan.

CSO: 5500/7099

REPORTERS VISIT BHARAT ELECTRONICS ENTERPRISE

New Delhi PATRIOT in English 15 Mar 82 p 4

[Text] Bangalore--The Bharat Electronics Ltd public sector enterprise has embarked upon large-scale manufacture of space-quality solar cells which will power many of the future satellites to be launched by the Indian Space Research Organisation.

These solar cells have been designed and developed indigenously and would generate power through conversion of solar energy. The undertaking, which received a bulk order of one lakh cells from ISRO last year, would deliver its first consignment of 30,000 cells this year and the remaining by next year.

This undertaking is said to be the country's biggest manufacturer of sophisticated electronic equipment for communication and navigational purposes. Situated in a sprawling area and employing about 14,000 workers, the major expanse of its activities are geared to meet the defence requirement.

BEL Managing Director N.L. Krishnan told a group of Delhi-based journalists during a recent visit that since its inception in 1954 the Undertaking's major priority had been in the field of communication technology and it has made the country self-reliant in this field. Today most of the radio-communication equipment and system requirements for the Armed Forces, Police AIR Doordarshan and also of the local industry were met by BEL.

With the production on in BEL's three units--Bangalore, Pune and Ghaziabad, Mr Krishnan said that the undertaking expected to achieve a sales turnover of Rs 110 crores in 1981-82. The company, he pointed out, has booked orders worth Rs 350 crores.

Due to capacity constraints and commitment to the domestic market, the export potential was yet to be fully exploited, Mr Krishnan said, and added that export was steadily progressing. At present the undertaking manufactures large range of products from a small signal device to 200 kilowatt transmitter and modern sophisticated radar equipment.

BEL venture in the manufacture of semi-conducters with a foreign collaboration in 1962 and today it produces over 22 million devices meeting about 75 percent of the country's requirement in the field of radio-receiver

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industry. With the advent of silicon technology in 1967, it undertook production of silicon devices for the radio and electronic industry.

Out of the country's demand standing at one billion silicon signal devices, BEL is meeting about 35 percent of the total requirement. The undertaking is also producing four types of integrated circuit types for the TV industry.

The production of these semi-conductor requires an intricate handling and is largely done by women. The gross turnover through these semi-conductor has been Rs 11 crores.

BEL has entered into a joint collaboration with a Swiss form for the production of 100 KW medium wave transmitter for the All India Radio. Other communication equipment manufactured by it include Medium Frequency (MF) Very High Frequency (VHF), Microwave, Digital Communication System, navigational radar and meteorological radar system, sound and vision broadcasting equipment. The undertaking has already completed two turnkey communication projects of IOC pipeline communication project and a microwave communication project for Tamilnadu police.

BEL entered the field of vacuum technology with the production of valves for radio receiving sets in 1961 and later for TV sets. Today, the undertaking manufactures a variety of electron tubes including receiving valves, transmitting tube high voltage vacuum capacitators, X-ray tube, TV picture tube, Cathode Ray tube and other items. The transmitting tube developed by it covers a range from a few watts to 200 KW.

Although BEL undertook production of TV picture tubes in 1970 and set up an automated plant for manufacturing 2 lakh picture tubes per annum, the glass shells for these tubes are still being imported. The setting up of a glass shell plant which cost around Rs. 26 crores is reportedly awaiting the Government's approval.

Another area of emphasis has been in the field of radar where BEL is said to be rendering a pioneering service. Its unit at Ghaziabad which earned a profit of Rs 3.23 crores last year manufactures both primary and secondary radar. The three dimension static radar developed by it provides an accurate information on the height, distance and bearing of the aircraft. The undertaking has also designed IFF (Identification Friend of Foe) secondary surveillance radar.

Up till now BEL has manufactured six VHF Omni-Range (VOR), a modern navigation aid for aircraft, which have already been installed at different air airports. The undertaking has also designed cyclone and storm warning radar for meteorological department.

The main thrust of BEL according to Mr Krishman has been directed to achieve indigenisation in its production. Although initially joint collaborations were undertaken, he said, these were now being slowly curtailed. He said that more and more equipment are now being wholly designed, developed and engineered by the BEL research team. BEL received Import Substitution Award (Gold) in 1979-80 and 1980-81.

CSO: 5500/7098

NEWSMEN TOLD OF NEW RADAR DEVELOPMENTS

New Delhi PATRIOT in English 15 Mar 82 p 4

[Text] Bangalore--India has successfully developed a "weapon location radar" with multi-target capability. The radar can locate mortar and guns.

The radar, developed by the Electronics and Radar Establishment (LRDF) here uses an online digital computer specifically designed for carrying out computation in realtime. It has been fully tested and ruggedised to meet field conditions.

Disclosing this, LRDE Director R.P. Shanoy told a group of Delhi-based newsmen that the radar has been extensively tried out with the assistance of army and plans are afoot for fabrication by the Bharat Electronics Limited for further evaluation and finalisation by army.

Besides, Dr Shanoy said, the establishment has launched a programme for the development of highly sophisticated "search radars" which would detect targets flying at low altitude and hugging the terrain. These radars were solid state and use the latest technique of moving target detection and digital velocity filters. A moving target indicator has also been fabricated.

The establishment which has incurred a gross investment of Rs 2492.5 lakhs up till now has developed an automatic electronic exchange based on time-shared space division, wired programme processor principle for field use by the Indian Army. It has facilities like call enquiry, call transfer, priority conference, trunk barring. An extension of this system, a time division multiplex exchange which can convert the above facilities to any subscriber number has also been developed.

Dr Shenoy said an integrated telephone exchange which could process hundreds of telephone calls or more than 200 telex messages or scores of computer data channels had designed by them would serve as a trunk exchange for the army. This instrument is controlled by computer.

Realising the importance of the computer, Dr Shenoy said the establishment has launched a programme for the development of ruggedised computers which would be needed by services in communication and radar system. These computers would be based on multi-micro processor architecture. In the field of medicine they have developed a Medical Data Processing and Automatic Exchange Diagnosis Systems (MEDPAD) for online diagnosis of various life-threatening heart diseases and also for initiating treatment.

The LRDE has also designed nickle-cadmium batteries which are superior as far as storage life is concerned. An electronic survey measuring system, "Distance Measuring Equipment" which can measure to an accuracy of 10 cm in 40 km, also been designed.

CSO: 5500/7098

INDIA

BRIEFS

APPLE SATELLITE REPORT--Bangalore, March 13 (PTI)--APPLE India's prestigeous experimental communication satellite is "functioning normally" and its services are being fully utilised, Dr R.M. Vasgam, Project Director, APPLE, said here today. Docked in geostationary orbit 36,000 kms above earth, APPLE was successfully used for the direct telecast of the IAF firepower demonstration at Tilpat range on the golden jubilee of the Indian Air Force last month. Dr Vasgam said the Space Application Centre, Ahmedabad and the Posts and Telegraphs Department were fully utilising the services of APPLE for their routine work and conducting various experiments. [Text] [New Delhi PATRIOT in English 14 Mar 82 p 5]

BANGALORE EXCHANGE OPENED--Bangalore, March 13 (PTI)--With the commissioning of the 10,000 line telephone exchange here today, Bangalore city moved up to the fifth position in the country in terms of number of telephone connections relegating Ahmedabad to the sixth position. Karnataka Finance Minister M. Veerappa Moily, who inaugurated the new exchange, said that efficient working of telephones would accelerate the development of trade and industry. Mr J.D.A. John General Manager telephones, Bangalore, said orders had been placed with a Japanese company for the supply of modern equipment for the 10,000 line Vijayanagar exchange. The equipment was expected by the middle of this year. Mr John said about 9000 applications were waiting for telephones in Bangalore. [Text] [New Delhi PATRIOT in English 14 Mar 82 p 5]

PROTO-INSAT PROJECT--New Delhi, Feb. 28--As a first step towards indigenisation of the space segment of the operational multi-purpose Insat system, the Space Department has proposed to launch the "Proto-Insat" project. "Proto-Insat" is conceived of as an indigenous second generation satellite. This project is regarded as an important step for eventually replenishing the imported Insat space segment. The first generation "Insat" system is now at an advanced stage of implementation and the launching of the Insat-I is scheduled for this year and Insat 1-B in 1983. The sanctioned cost of Insat I project is Rs. 173 crores of which Rs. 113 crores is for the space segment consisting of two multipurpose satellites in the geo-stationary orbit and a master control facility. The budget provision for Space Department in 1982-83 is Rs. 112.37 crores compared to the revised estimate expenditure of Rs. 109.13 crores in 1981-82. [Text] [Madras THE HINDU in English 1 Mar 82 p 16]

CSO: 5500/7095

AMBITIOUS COMMUNICATIONS EXPANSION PLAN OUTLINED

Islamabad THE MUSLIM in English 26 Feb 82 p D Magazine

[Text]

KATHMANDU: Nepal plans to depend heavily on sophisticated communications technology to bring isolated Nepalese villagers into the mainstream of the modern world.

The visionary plan has yet to take a precise shape, but an outline appears to have been etched in the minds of Nepal's communications planners.

In broadcasting, 1 130-million-rupee (($10 million) project is already under way to establish a countrywide medium wave network that will enable poor villagers to tune into the world using a cheap radio set. Television is also on its way in Nepal, but how much of it will cater to the rural areas is still uncertain.

Newspaper publishers are looking forward to printing simultaneous editions in different parts of the country with the help of facsimile machines.

Once implemented, these plans will be an improvement over current communications facilities. These have proven inefficient and impotent to cope with the increased demand.

Take the case of postal services which are notorious for sluggishness and incompetence. Although mail traffic has increased tenfold, the number of staff remains static. And there are no plans to introduce machinery in the Postal Department to speed the flow of letters.

The need for improvement of Nepal's communications network is great since it will eventually provide an important foundation to the country's massive rural development projects.

It is only through the improvement of these communications facilities that the villagers' voices can be heard and their participation in the development process ensured. At the same time, extension workers have to be re-oriented to be able to make better use of improved communications facilities at the field.

These sophisticated communications technologies naturally need hefty funding. But Nepal's communications officials seem unfazed by their funding needs, saying they will be banking on "friendly donors".

The biggest problem that Nepal will face, they say, will be the management and continued growth of the country's communications network.

Nepal's managerial confidence will be put to test when its first communication satellite earth station will be ready by 1983.

The Cable and Wireless Company of Hongkong has asked the Nepalese Government to let it run the satellite services. However, the Government is undecided whether to operate it by itself or to hand it over to a foreign company.

This British-aided project provides a Standard-B earth station to Nepal. It will allow Nepal to use up to 60 channels to telephone connections from the INTELSAT hovering 36,210 kilometres above the equator.

With the new satellite facility, the international communication of Nepal will greatly improve.

But an even earlier managerial test will involve the communications satellite India is scheduled to launch this year. India has offered the use of the satellite, called INSAT, to Nepal, Sri Lanka and Bangladesh.

According to Ram Prasad Sharma, general manager of the Nepal Telecommunication Corporation (NTC), INSAT is the best means for the Nepal-India communications traffic. It will also serve as the best way to improve the country's radio and television transmissions.

With the help of the Japanese Government, Nepal is now installing a medium wave network.

When this $10 million network will be finished in 1983, about 55 per cent of the country's population will have access to modern communication.

But the country's plan to expand its broadcasting facilities is handicapped by the awfully small number of radio sets in the country. According to a study by the New Era, a socio-economic research group, there is only 1 radio set for every 1,000 people.

Other data indicate that there are about 300,000 sets for Nepal's 14 million people. B.P. Shah, Director-General of Radio Nepal, has sought UNESCO assistance in establishing a radio manufacturing complex in the country.

While Mr. Sharma dreams of leapfrogging into the satellite age for Nepal's mass communications, he equally realises the physical, economic and technical difficulties that exist in the rural areas of Nepal.

The very Himalayas that attract tourists into Nepal every year, making them one of the country's top dollar earners, are also the barrier against a more effective communications system.

"We have to adopt a technological system of very low capacity and robust construction requiring a minimum amount of skill for maintenance," says Mr. Sharma.

He adds that with the rising costs of imported energy, the country's communications network must depend heavily on non-conventional sources. For example, 13 out of the country's 84 telegraph offices are run by solar power.

Such indigenous sources of energy have enabled Nepal to develop what Mr. Sharma calls a "backbone trunk network." This primarily refers to the telephone network around the country.

There are currently 22 telephone exchanges in Nepal, of which only four are automatic. The exchanges have a capacity for 15,370 lines, of which 11,000 are automatic.

Under an on-going expansion programme, an additional 20,600 lines will be added. However, it is doubtful it will meet the high demand of people for a telephone line.

But when this expansion project, slated for completion next year, is finished, it will finally connect the major towns and other strategic areas in the country.

Mr Sharma says: "By the end of this decade, all the major cities will be having automatic dial telephone systems providing local and trunk facilities nationwide and throughout the world."

This improved telephone network will also enable newspapers to be printed simultaneously in various parts of the country. In the developed countries of Asia, such as Japan, facsimile newspapers are already being published.

With such a facility, Nepalese publishers will be able to surmount their circulation problems and to create truly national newspapers.

Bharat Dutt Koirala, chairman of the Gorkhapatra Sansthan which published the most widely circulated daily, the Gorkhapatra, plans to set up at least two facsimile machines in the eastern and western parts of Nepal.

Such machines will allow the centrally-edited paper in Kathmandu to be printed simultaneously by offset in other parts of the country. This will cut down on transport costs and delivery time. Currently, it takes 15 days before readers outside Kathmandu can get their newspapers.

Even if Nepal's sophisticated communications plans are realised, studies show that interpersonal communications will still form the basic motivator for development.

The mass media may provide the means of transmission of development messages, but it is up to village leaders to encourage people into action.

For the last two decades, the Nepalese Government has been tapping village leaders to hasten rural development and at times for political propaganda.

To improve farming, for example, the Ministry of Food and Agriculture has appointed a large number of junior technical assistants (JTA). In other countries, they may be called extension workers. Now, there are similar counterparts for health, family planning, cooperatives and women.

They, the extension or field workers, are the rural communicators who have penetrated village societies and made a dent in rural lifestyles.

But still, more need to be done by these rural communicators. Agricultural production per unit has gone down. Population growth is overtaking economic growth. And the stagnation of rural areas is all too obvious.

Rural communicators can do more to stimulate development by penetrating more of the villages that dot Nepal's mountains and small strips of plains.

"There is a big vacuum of information in our villages", says Bihari Krishna Shrestha, joint secretary at the Ministry of Local Development and Panchayat (MLDP). He regards communications as an on-going effort for rural development "but it is the area we lack and we lack very badly".

Mr Shrestha adds with a sense of sadness, "We have messages but no sufficient means to communicate to the villagers".

The MLDP is currently handling all the integrated rural development projects in the country. This costs nearly 1.5 billion rupees ($101.5 million) with the assistance from U.N. agencies and developed countries.

In all these development projects of Good and Agriculture, which gets the lion's share from the annual national budget, conducts only a 15-minute programme over Radio Nepal four times a week. Despite the programme's minuscule budget it is the biggest of its kind.

The level of preparedness to back the development efforts with communications is not meeting the need at all.

B.K. Shrestha of the MLDP believes that communications should be the cause and effect of rural development. But he confesses unabashedly, "When applied in Nepal's context it has become neither the cause nor the effect of the village development".

Mr. Shrestha, therefore, rightly feels that mass communication should be revolutionised to achieve the targets of rural uplift. Pleading strongly for the use of latest technology in mass media in Nepa, Mr. Shreshta declares: "If you don't put up, you will have to shut up".

In this connection, K.N. Sharma the MLDP training chief, says, "Once the mass media are effective in the villages, there will be a drastic change in the training programmes. Instead of feeding information to the villagers -- as we are doing now -- we will be imparting skill to the villagers".

That will make a great difference to the rural scenario and fill in the information gap in Nepal's villages. This gap has been made evident in several studies.

The fertility survey of 1976, for example, revealed that while 22 22 per cent of the women surveyed had heard about family planning, only 6 per cent of them knew where they could get contraceptives and advice.

The information-starved society of Nepal presents a contrasting picture with what Junnosuke Kishida, director of the editorial board of Asahi Shinbu

director of the editorial board of *Asahi Shimbun*, calls "Japan's information-oriented society".

At a time when Nepal is trying to make a cheap listening set available to the people,Japan is experimenting with a system of recalling information from computers over telephone and receiving the answer on their television screen. It is called the CAPTAIN system. It stands for Character and Pattern Telephone Access Information Network.

This type of communication innovation is a far-fetched thing to use in Nepal. What is, however, being done in Nepal is to co-ordinate the efforts of mass media and the personal communicators for effective communication in the rural areas.

The mass media are valued for generating awareness among the farmers by disseminating general information. However, the farmers will hardly embark on a new technology simply on this basis. Mass media at the most can frame a vague outline in their mind. The role of interpersonal communicators -- whether he be an agricultural technician or family planning volunteer -- comes in here to motivate and help the villagers adopt new technologies.

The Nepalese Government has yet to take cognizance of the role of communications in development. By so doing, it will be able to make the best use of the resources allocated for rural development. -- *Depthnews*

CSO: 5500/5742

PAKISTAN TO PRESS FOR WORLD SPACE AGENCY

Karachi BUSINESS RECORDER in English 18 Mar 82 p 3

[Text] Pakistan would press for the establishment of an international space agency to further the scope and content of United Nations aided programmes for peaceful applications and uses of space particularly for benefit of developing countries at the 25th session of UN Committee on peaceful uses of outer space at New York from March 22.

This has become important in view of increase in militarization of space with consequential hazards of shifting the scene of conflict to space at the very start should such a catastrophe take place.

Pakistan will be represented at the session due to last till April 2, by the Chairman, Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), Salim Mehmud.

The 53-member committee of which Pakistan is a member deals with space science and technology maters at the UN level and reports to the general assembly. It is assisted by two sub-committee — scientific and technical and other legal.

The committee is also acting as advisory body for UNISPACE-82 conference which will be held in Vienna in August this year to highlight the peaceful uses and applications of space. The first conference was held in 1968.

The agenda of the coming session pertains to formulation of principles for regulating remote sensing activities of nations, operation of direct broadcasting satellites, use of nuclear power source in space, definition of limits of outer space and its linkage with geo-stationary orbit and other activities of nations in space.

These issues have, however, evaded resolution on account of their complexity and diverse interests of nations represented at the committee. In case of remote sensing of earth from satellites there is a view point that such data obtained by sensing states should not be made available to a third country without consent of the country to whose territories it pertains.

The second school of thought is that there should be no restriction to the dissemination of satellite data upto a certain clarity to a country which requests for it.

The clarity of data in technical terms refers to the minimum size of the object on the ground that can be identified in satellite picture.

There are difference of opinions in formulation of a convention to regulate direct broadcasting from satellites. In the first category are countries who would like that prior consent of the country to which transmissions are beamed be obtained on programme content by those countries using satellite for programmes beaming. Others view that there should be no requirement of such prior consultations and everyone has free access to information available all over the world without hindrance.

On the question of defining outer space-establishment of height beyond which outer space starts — equatorial states claim that portions of geo-stationary orbit above their countries be under their sovereignty. This claim is opposed by other states due to uniqueness of this orbit, there is a great demand for placing of satellite in this orbit by various countries and the UN has to really deal with this ever escalating problems.—PPI.

CSO: 5500/5739

BRIEFS

BALUCHISTAN TELEVISION BOOSTER--The governor of Baluchistan will officially inaugurate the new TV booster in Sibi on 18 March. [GF181401 Karachi JASARAT in Urdu 17 Mar 82 p 6]

CSO: 4600/5741

SATELLITE COMMUNICATIONS DEMAND ASSIGNMENT SYSTEMS STUDIED

Shanghai DIANXIN KUAIBAO [TELECOMMUNICATIONS INFORMATION] in Chinese No 10, 1981 pp 7-15

[Article by Wang Mingzhong [3679 2494 1813]: "Comparison and Selection of Demand Assignment Systems for Domestic Satellite Communications"]

[Text] Abstract

This article analyzes and compares several types of demand assignment systems, such as the scattered control system, the centralized control system and the mixed control system which may be used for domestic satellite communications at present. The article also concludes that in the level of technological sophistication or the rate of utilization based on cost, the scattered control system is the best, followed by the mixed control system, while the centralized control system is the poorest.

The article uses information of a scattered control demand assignment system, i.e., the experimental SCPC/DAMA system.

General Description

Because of the broadcasting characteristics of satellite communications and because satellite communications are not limited by distance and geographic conditions, communication via satellite is a strong means to establish a domestic communications system. Under certain situations, it is the only means. Therefore, some nations have established their own domestic satellite communications network. Some other nations are in the planning stage. Because domestic satellite communications have brought about more and more technological and economic benefits, we can predict that in the coming years, domestic satellite communications will enjoy even greater development.

Considering the rational combination of technology and economy, the domestic satellite communications systems established early were mostly pre-assignment type SCPC systems, such as Canada's ANIK system and the communications system between Alaska and the continental United States. But as communications continue to increase, as the number of ground stations continues to increase, the earlier pre-assignment method no longer satisfies the development needs.

Therefore, in recent years everyone has begun studying the demand assignment method and everyone is trying to select a technologically advanced and economical, low-cost system. In considering the above situation, some nations used the demand assignment technique in the beginning when they began establishing their domestic satellite communications network, such as Algeria and Indonesia, etc.

At present, our nation is at the beginning stage of developing domestic satellite communications. How we summarize the beneficial experience and lessons from these nations that already have domestic satellite communications systems will be very meaningful in promoting the establishment and development of our nation's domestic satellite communications.

Our nation has a large population. Its border regions are expansive, and at the same time the geographic environments are all different and the distribution of population in these regions is different. On the other hand, our nation is a developing nation. All this means that for our nation's domestic satellite communications, there are many accesses that are close but the amount of communication is very small. Therefore, using demand assignment is necessary. This is because when the amount of communication is small, regardless of how many ground stations there are, demand assignment always provides the best rate of utilization of the circuits and the highest rate of utilization of the investment in telecommunications channels. Also, its use is very versatile and convenient.[1] But the main subject of this article is to discuss and determine the best method of control.

Of course, establishment of our nation's domestic satellite communications cannot be accomplished completely by one type of demand assignment system, but this at least is a key to the overall situation. In view of our nation's situation, we can envisage that in the near future, the FDMA method can be used for our nation's southeast coastal region between the various larger cities, and in the long-range future, we can consider developing the TDMA method. This is because the amount of communication between these regions is large while the number of accesses is limited. For the expansive inland and border provinces, including communications with the southeast coastal region, a nationwide communications network is involved. Therefore, how we design such a demand assignment system must be carefully studied.

Three Control Methods of a Demand Assignment System

The demand assignment system in satellite communications can utilize different methods of control--for example, scattered control, centralized control and mixed control. In other words, using different control methods enables us to construct different forms of demand assignment system. To facilitate analysis, these different control methods are briefly described here.

1. A Scattered Control Type Demand Assignment System

The so-called scattered control type demand assignment system refers to a system based on point-to-point communications channel assignment, state monitoring, fee recording, and telephone communication. In other words, each terminal

CSO: 5500/5733

station in the system can select satellite communications channels and telecommunications accesses freely, i.e., a fully variable demand assignment method.

A scattered control demand assignment system forms a network structure, as shown in Figure 1. In the diagram, the solid lines are telephone communications channels and the dotted lines are public access communications channels.

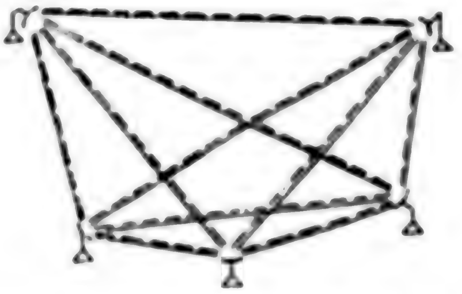


Figure 1. A Scattered Control Type Demand Assignment System

SPADE system[7] can serve as a typical representative of a scattered control type demand assignment system. It began service over the Atlantic in 1972. The whole system allows a maximum reception of 49 ground stations. Each station can install a maximum of 60 telephone communications channels. The public access communications channels of the system use TDMA while the telephone communications channels use frequency division.

2. Centralized Control Type Demand Assignment System

The so-called centralized control type demand assignment system is one in which assignment of communications channels, state monitoring, fee recording, and telephone communications must all go through a main station. This means that in this system, when any one of the terminals wants to place a call, it must first request the main station, then it must wait until the main station connects with the terminal being called, and finally, the main station connects the caller and the called party via the switchboard.

The centralized control type demand assignment system is a star structure, as shown in Figure 2.

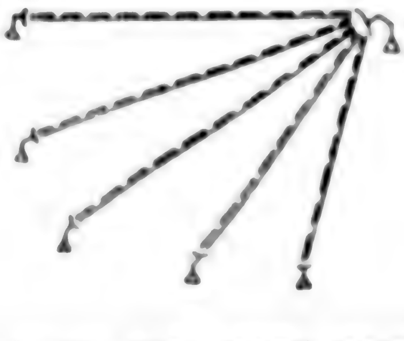


Figure 2. Centralized Control Type Demand Assignment System

wave system being adjusted to television.

In reply to the main question he said TV relay centres were proposed in the Kasauli (H.P.) and Kodaikanal (Tamil Nadu) hilly areas during the sixth plan.

In the northeastern region the setting up of a number of low-power transmitters was also under consideration, he said.

CSO: 5500/7096

The DYNAC system[3] can serve as a typical representative of the centralized control type demand assignment system. This system has a main station which can receive communications from 10 ordinary stations. The data transmission rate is 2 to 4 megabits/second. The number of telephone communications channels does not surpass six. The main station sends data to ordinary stations via one TDM communications channel. All ordinary stations send data to the main station via the TDMA communications channel. Communication between two small stations must go through the main station via double jumping.

It can be seen from the above diagram that the centralized control type demand assignment system cannot avoid double jumping, and therefore the rate of utilization of the satellite channels is reduced by onefold and the use is extremely inconvenient.

3. Mixed Control Type Demand Assignment System

The so-called mixed control type demand assignment system refers to a system in which assignment of communications channels, state monitoring, and fee recording are performed by the main station but the communications circuits do not pass through the main station. Like the scattered control type demand assignment system, communications are based on point-to-point communications, and the caller and the one called can communicate directly.

The telephone communications channels of the mixed control type demand assignment system form a network structure, while the public access communications channels form a star structure, as shown in Figure 3.

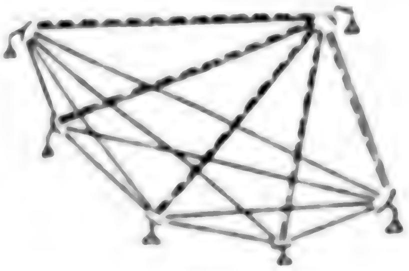


Figure 3. Mixed Control Type Demand Assignment System

The domestic satellite communications system[4] of Algeria can serve as a typical representative of the mixed control type demand assignment system. This system has a main station and 13 ordinary stations (long-range plan calls for 31). The near term capacity of the ordinary station is 2 to 4 telephone circuits and the long-range plan calls for 16 telephone circuits. This system has two public access communications channels. One is the inquiry channel from the main station to the ordinary stations, and the other is the responding channel from the ordinary stations to the main station. The telephone communications channels operate by frequency division.

In the following, we will analyze and compare the technical and economic aspects of each type of system.

Technical Comparison of the Different Control Methods

Although the three different control methods can all be used to form a demand assignment system, from the technical viewpoint, there are major differences among these three different control methods. These differences are concentrated mainly in the following aspects: the rate of utilization of the satellite circuits, the versatility, the reliability of the system, and their demand upon the message processor. The following is an analysis and discussion of these problems.

1. The Rate of Utilization of Satellite Circuits

In multiple access satellite communications, the rate of utilization of satellite circuits by demand assignment, especially fully variable demand assignment, is the highest. The scattered control type demand assignment system is the most typical representative. In such a system, the communications circuit is based on point-to-point communications, so the rate of utilization of the circuits is the highest. The centralized control type demand assignment system has only half the number of usable satellite communications channels compared to the previous system, so the rate of utilization of the circuits is very low. Because the communications circuits in the mixed control type demand assignment system are also based on point-to-point communications, therefore, the rate of utilization of the circuits is exactly the same as that of the scattered control type.

2. Versatility of Use

In the scattered control type demand assignment system, any terminal can freely select its communications access, and it can freely select the communications channel. Therefore the use of this system is the most versatile and the most convenient, and the time required for connection is the shortest. In the centralized control type or the mixed control type system, every terminal station must first request the main station to make a call, and then it must wait until the call is placed. To the user, this is not convenient. At the same time, the time required for connection is long, generally two to three times the time required by the scattered control type system.

Also, the ability to adapt to the gradual development of the satellite communications network shows that the scattered control type is more versatile. This is because this demand assigment system only has regular stations; it does not have a main control station, so stations can be established and developed one by one according to need. Especially during the beginning period of setting up the network when there are fewer ground stations, if other control methods are used, then a main control station must be established first. But because the scale of the main control station must take into consideration the final capacity according to development, the effort would be uneconomical and inconvenient.

3. Reliability of Operation of the System

Because the scattered control demand assignment system does not have a main control station, a breakdown of any ordinary station will not hinder the operation of other ordinary stations, and thus the operation of the entire network will not be affected. But the situation in the centralized control type and mixed control type demand assignment systems is entirely different, because in these two systems, the operation of the entire network is borne by the main control station. Obviously, when the main station breaks down, the whole network is paralyzed. Therefore, this argument alone shows that the scattered control type demand assignment system is the best system.

4. Demands Upon the Message Processor

The message processor is the key equipment that realizes demand assignment. At the same time, the different control methods place different demands upon the message processor. For example, because the demand assignment system of the scattered control type does not have a main control station, it does not require large computers. But in the centralized control type or the mixed control type demand assignment systems, the main station is responsible for monitoring, fee collection, and assignment of communications channels of the whole network, so they require large computers.

The scattered control type does not require large computers. This is an advantage that is obvious. But are there any differences in the demands upon the computers it uses and upon the message processors used by ordinary stations in the centralized control type or the mixed control type systems and how much difference is there? There are still varying opinions and these are being debated. To compare the different demands made by these three control methods upon the message processor more concretely, it is necessary to conduct further research and discussion.

For this, we first assume that the job content for these different control systems upon the message processor based on the information and data of the experimental SCPC/DAMA system which we have already developed.

The experimental SCPC/DAMA system is a scattered control type demand assignment system. To realize demand assignment by the system, the message processor at each station must complete the following five functions:

(1) Monitor the blocking/opening state of each station;

(2) Assign satellite communications channels in real time;

(3) Complete message exchange between all stations;

(4) Complete message exchange between this station and long-distance switchboards;

(5) Complete station operations, man-machine communication.

The structural diagram of the programs for executing the five functions described above is shown in Appendix I. It should be pointed out that in the five functions above, (3) and (4) are major functions. Their procedures have the most content and are the most complex. Therefore, these two functions are key functions that determine the demands upon the message processor.

When using the centralized control or mixed control methods, there used to be a lot of misconception concerning the ordinary stations. It appeared that as long as the main control station had a set of large computers, the other ordinary stations could do without message processors. This is actually not the case, because in a centralized control or mixed control type demand assignment system, an ordinary station must complete the following functions before it can communicate:

(1) Complete message exchange between this station and the main control station;

(2) Complete message exchange between this station and long-distance switchboards;

(3) Complete the station's operations, man-machine communication.

It would be very difficult for an ordinary station to complete the above functions without a message processor. For example, the Royal Society of Canada (C.R.C.) once conducted an experiment[5] in demand assignment via the CTS satellite. This experimental system used centralized control. The main control station used the PDP 11/20, while the ordinary stations used PDP-11/10. Later, the cost was considered too high and thus these were changed to microprocessors with internal memory of 32K.

The three functions above show that the functions performed by the message processor of ordinary stations of a centralized control type system are indeed less than those performed by the message processor in ordinary stations of scattered control type systems. This means that the demands upon the message processor are lower. But it does not mean that the message processor used in ordinary stations of the centralized control type or the mixed control type demand assignment system is simpler than that used in ordinary stations of the scattered control type demand assignment system. To address this question, we have used details of the designed programs (see Appendix II) that generate the various modes for the terminal and the program that enables the terminal to receive communications via common access satellite communications channels in real time assignment. We can see from Appendix II that the number of program operations to receive data sent through all the common access communications channels is 17 and the corresponding program statements total 1904. But the 9th statement that monitors the state of the satellite circuits and the 10th statement that monitors the state of the terminal comprise a total of only 76 program statements. Therefore, although the message processor of an ordinary station of the centralized control type or a mixed control type demand assignment system performs two functions less than the message processor of an ordinary station of the scattered control type demand assignment system, in program design, the difference is only 76 statements. Relative to the 1904 program statements in the reception program for the common access communications channel, the difference is very small. If we compare this difference with the whole program of approximately 5,000 statements, the difference is negligible. Therefore, we can regard the message processors of ordinary stations of the demand assignment systems of these three types of control methods as the same.

From the above, we can conclude the following:

1. Technical analysis shows that the scattered control type demand assignment system is the best among these three demand assignment systems. The mixed control type demand assignment system ranks second and the centralized control type demand assignment system is the worst.

2. Comparison of the scattered control type demand assignment system and the other two types of systems shows that the scattered control type demand assignment system has the following advantages:

(1) The rate of utilization of the satellite circuits is the highest;

(2) It is versatile, convenient, it can adapt to the needs of gradual development, and the connection time is the shortest;

(3) There is no main control station, and the system is relatively stable and reliable;

(4) The message processor used in ordinary stations is the same as the message processors used in the other two systems.

Economic Comparison of Different Control Methods

In the above, we started out from the technical viewpoint and analyzed and compared the three different control methods and their corresponding demand assignment systems. In the following, we will start out from the economic viewpoint to compare these three demand assignment systems.

To facilitate discussion, we have made the following assumptions:

1. The dimensions of the antenna:

All the ordinary stations of the scattered control type demand assignment system use the 10-meter antenna or the 5-meter antenna.

All the ordinary stations of the centralized control type demand assignment system and the mixed control type demand assignment system use the same 10-meter or 5-meter antennas, while the main control station uses a 20-meter antenna.

2. Retransmitter

We rented the INTELSAT-4A retransmitter which generates hemispherical beams of 36 MHz bandwith.

3. Modulation and Rate

AM-QPSK, 32 kilobits/second, error code rate: 10^{-3}.

4. Price reference

Antenna:	5-meter:	$30,500
	10-meter:	$95,000
	20-meter:	$400,000

Long-distance automatic switchboard (1,000 sockets): $1.875 million

Computer: $312,500

Ground station:	5-meter station:	$562,000
	10-meter station:	$625,000
	20-meter station:	$937,000

Retransmitter: Annual rent for one retransmitter is about $1 million.

Comparison of Investment To Build the Network

Scattered Control Type

(1) Calculations based on the 10-meter antenna:

When an ordinary station uses a 10-meter antenna and when renting an international satellite, better power utilization can be realized and the advantages of scattered control can be fully developed. When using ΔM-QPSK with a communications channel interval of 22.5 kHz at a rate of 32 kilobits/second via a 36 MHz bandwidth retransmitter, 1,600 communications channels can be obtained. The amount of telephone communication corresponding to this would be above 750 oulan [2962 5695]. Based on this amount, it is entirely suitable[6] to our nation's specific situation to establish a domestic satellite communications network with 500 or more ground stations. Of course, there can be fewer; it is not absolutely necessary to have so many ground stations.

At this time, the major investment costs for the whole network would include the following:

Satellite communications: Annual rent is $1 million.

Ground facilities: Using all 10-meter stations, the cost of each station would be $625,000.

The major items of equipment are:	10-meter antenna:	$95,000
	High-power amplifier:	$102,000
	Parameter amplifier:	$15,000

In addition, the number of satellite communications channels that can be used is 1,600.

Let the number of ground stations be N, then we can calculate the investment A for each satellite communications channel according to the various parameters described above. This numerical value represents the rate of utilization of the cost of the system.

The numerical value A is given by the following formula:

$$A = \frac{100}{n} + \frac{62.5}{n} \cdot N \qquad (1)$$

where

$n = 1,600$
$N = 3, 4, 5, \ldots\ldots\ldots\ldots 500$

i.e., $A = 0.0625 + 0.0039N$ (2)

Because the numerical value A is a function of the number of stations N, therefore we can calculate the relationship between A and N as shown in Table 1. The corresponding curve is curve 1 shown in Figure 4.

Table 1. Corresponding Numerical Values of A - N

N	3	10	100	500
A	$1,700	$4,500	$39,600	$195,600

(2) Calculations using a 5-meter antenna:

The use of a 5-meter antenna for Intelsat limits the power. The number of channels allowed by one retransmitter is only 1/4 the number of a 10-meter antenna, i.e. n = 400. The corresponding amount of telephone conversation is 171 oulan [2962 5695]. Because the amount of telephone conversation is small, generally the antenna can only serve 150 ground stations.

The investment in the whole network is determined by the following:

Satellite communications: Annual rent is $1 million.

Ground facilities: When all are 5-meter stations, the cost per station would be $562,000.

Number of communications channels n: 400.

Let the number of ground stations be N, then the investment cost A per communications channel is given by the following formula:

$$A = \frac{100}{n} + \frac{56.2}{n} \cdot N \qquad (3)$$

Substituting n into the above we obtain:

$$A = 0.25 + 0.14N \qquad (4)$$

The numerical values of A - N calculated by the above formula are listed in Table 2, the corresponding curve is curve 2 shown in Figure 4.

Table 2. Corresponding Numerical Values of A - N

N	3	10	100	150
A	\$6,700	\$16,500	\$142,500	\$212,500

Mixed control type

(1) Calculations using the 10-meter antenna:

The main difference between the mixed control type and the scattered control type is whether there is a main control station or not. The investment in the whole network of this method is determined by the following:

Satellite communications: Annual rent is \$1 million.

Ground facilities: 10-meter station (ordinary station), \$625,000
20-meter station (main station), \$1 million
Computer, \$625,000

Number of communications channels: $n = 1,600$.

Let the number of ground stations be N, then similarly, we can obtain the relationship between A - N:

$$A = \frac{100+162.5}{n} + \frac{62.5}{n} \cdot N \qquad (5)$$

Or this can be written as:

$$A = 0.164 + 0.039N \qquad (6)$$

Table 3 gives the corresponding numerical values of A - N, the corresponding curve is curve 3 in Figure 4.

Table 3. Corresponding Numerical Values of A - N

N	3	10	100	500
A	\$2,800	\$5,540	\$40,640	\$196,600

(2) Calculations using the 5-meter antenna:

When using the 5-meter antenna and the same method, we can obtain the relationship between the investment cost A per satellite communications channel and the number of corresponding ground stations:

$$A = 0.65 + 0.14N \qquad (7)$$

The corresponding numerical values of A - N are listed in Table 4, the corresponding curve is curve 4 in Figure 4.

Table 4. Corresponding Numerical Values of A - N

N	3	10	100	150
A	$10,700	$20,500	$146,500	$216,500

Centralized control method:

(1) Calculations using the 10-meter antenna:

When using the 10-meter antenna, power utilization is better, so one retransmitter can have 1,600 communications channels. Using the same method, we can obtain the relationship between the investment cost A per satellite communications channel and the number N of corresponding ground stations as follows:

$$A = 0.55 + 0.078N \quad (8)$$

Table 5 gives the corresponding numerical values of A - N, the corresponding curve is curve 5 in Figure 4.

Table 5. Corresponding Numerical Values of A - N

N	3	10	100	500
A	$7,800	$13,300	$83,500	$395,500

(2) Calculations using the 5-meter antenna:

Because the power is limited when using a 5-meter antenna, a retransmitter can only have 400 communications channels with a corresponding amount of telephone conversation of 171? (oulan[2962 5695]). The maximum number of ground stations is about 150.

Similarly, the investment in the whole network is determined by the following:

Satellite communications: Annual rent is $1 million.

Ground facilities:	5-meter station:	$562,000
	20-meter station:	$937,000
	Computer:	$625,000
	Long-distance switchboard:	$1,875,000

Number of communications channels: $n = 400$

Let the number of ground stations be N

Thus the investment A per satellite communications channel is:

$$A = \frac{443.7}{n \cdot \frac{1}{2}} + \frac{56.2}{n \cdot \frac{1}{2}} \cdot N \qquad (9)$$

where the coefficient 1/2 of n takes into consideration the effects of the double jump. From this we can obtain

$$A = 2.21 + 0.28N \qquad (10)$$

Similarly, we can obtain the A - N relationship as listed in Table 6, the corresponding curve is curve 6 in Figure 4.

Table 6. The Corresponding Numerical Values of A - N

N	3	10	100	150
A	\$30,500	\$50,100	\$302,100	\$442,100

We can obtain the following conclusions from the results of the above calculations:

1. When the three types of control methods all use antennas of the same dimensions, the investment cost A per satellite communications channel corresponding to the same number of ground stations is smallest for the scattered control type, followed by the mixed control type, and it is largest for the centralized control type.

2. Because of renting international satellites, it is better to use the 10-meter antennas for a better utilization of power.

3. When comparing the scattered control method using the 10-meter antenna and the centralized control method using the 5-meter antenna for ordinary stations, the scattered control method is far better than the centralized control method.

Comparison of revenue after establishing the network:

The amount of revenue is determined by the amount of business in actual use. To compute the revenue, we must forecast the amount of business at present and in the future. Reference[7] analyzed and forecast the amount of business for long-distance telephony in our nation from 1981 to 1990. We assume that the amount of business borne by satellite communications is 1/10 the total amount of business presently borne by long-distance cable and radio communications. We also assume that each long-distance call lasts 6 minutes, and the fee per minute is \$0.60. We then calculate the revenue based on this. For simplicity, we will only calculate the revenues for the scattered control system with 10-meter antennas and the centralized control system using 5-meter antennas for comparison. It must be pointed out that in the centralized control method when the ordinary stations are using 5-meter antennas, the rate of utilization of power is very low, and the number of satellite communications channels which can be used is only 1/4 that of the former method. Also, because double jumps cannot be avoided in the centralized control system, therefore the actual number of communications channels that can be used is only 1/8 that of the former. Obviously, the total revenue from the centralized control system is only 1/8 that of the scattered control system.

The results of the computation are shown in Figure 5.

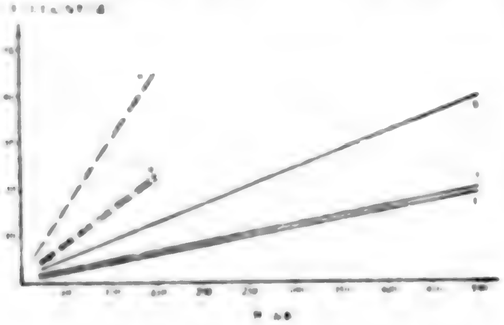


Figure 4. Relationship between the cost of investment A per communications channel and the number of ground stations.
A $10,000/communications channel
N is number of stations

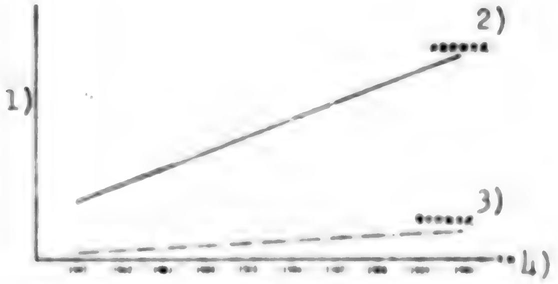


Figure 5. Comparison of revenue from our nation's satellite communications network after completion 1981-1990.

Key:

(1) Revenue	(3) Centralized control method
(2) Scattered control method	(4) Year

Conclusion

According to the above analysis, we can see that the scattered control method is best because this method can fully develop the unique capabilities of satellite communications. Not only is the technology advanced and rational, but at the same time, the rate of utilization of the cost is also very high, i.e., the investment per satellite communications channel is the smallest while the revenue is the largest. Therefore, we believe selecting this method to establish our nation's domestic satellite communications demand assignment system is the most suitable.

At present, the demand assignment systems established under the scattered control method or other control methods generally use the SCPC/DAMA method. In other words, they are established on the foundation of SCPC. Therefore, this demand assignment system and SCPC are mutually compatible, and its establishment does not affect the SCPC equipment. Also, during the course of establishing a demand assignment system, demand assignment and pre-assignment can coexist. This also provides conditions for final realization of demand assignment throughout the network.

In summary, we can clearly conclude the following:

1. The demand assignment system using the scattered control method is not only technically advanced and rational, but the utilization rate of cost is the highest.

2. Based on our nation's actual situation, the use of the scattered control method is suitable.

3. The development and establishment of domestic satellite communications must consider a combination of technology and economics. Otherwise, an inexpensive ground station may also be a ground station with the poorest rate of utilization. Similarly, a satellite communications system requiring less investment may be a satellite communications system that has the worst rate of utilization of cost.

REFERENCES

1. Wang Mingzhong [3679 2494 1813], "Selection of the Method of Assignment in Satellite Multiple Access Communications--Comparison of Demand Assignment and Pre-assignment Methods" (internal information)

2. "SPADE System Specification," ICSC-47-14E, W/6/1970.

3. Steven Salamoff, David Roos, Jeff Steinhorn, "A Low-Cost Data/Voice Communications Network," Telecommunications, August 1979, pp 71-76.

4. A. Bairi, J. Leonhard, "A Domestic Satellite Communications System for Algeria," IEEE 1975, International Conference on Communications, Vol I, pp 12-23, 27.

5. R.J. Campbell, "Hermes DAMA Experiment," Hermes, the Royal Society of Canada, Twentieth Symposium, Vol 2, pp 141-159.

6. Wang Mingzhong [3679 2494 1813], "DISDAMA System" (Internal information)

7. Luo Zongkuang [5012 1350 6315], Ge Yan [5514 1750], Zhu Shidong [2612 0013 2639], "Forecast of the Development of Our Nation's Telephone and Long-Distance Circuits 1981-1990."

8. Arnold Ph. Djiwatampu, "PALAPA: The Indonesian Domestic Satellite Communications System (SKSD)," AIAA 7th Comm Satel Sys Conf, San Diego, California, April 24-27, 1978, pp 582-589.

Appendix I: Program Structure of the Experimental SCPC/DAMA System

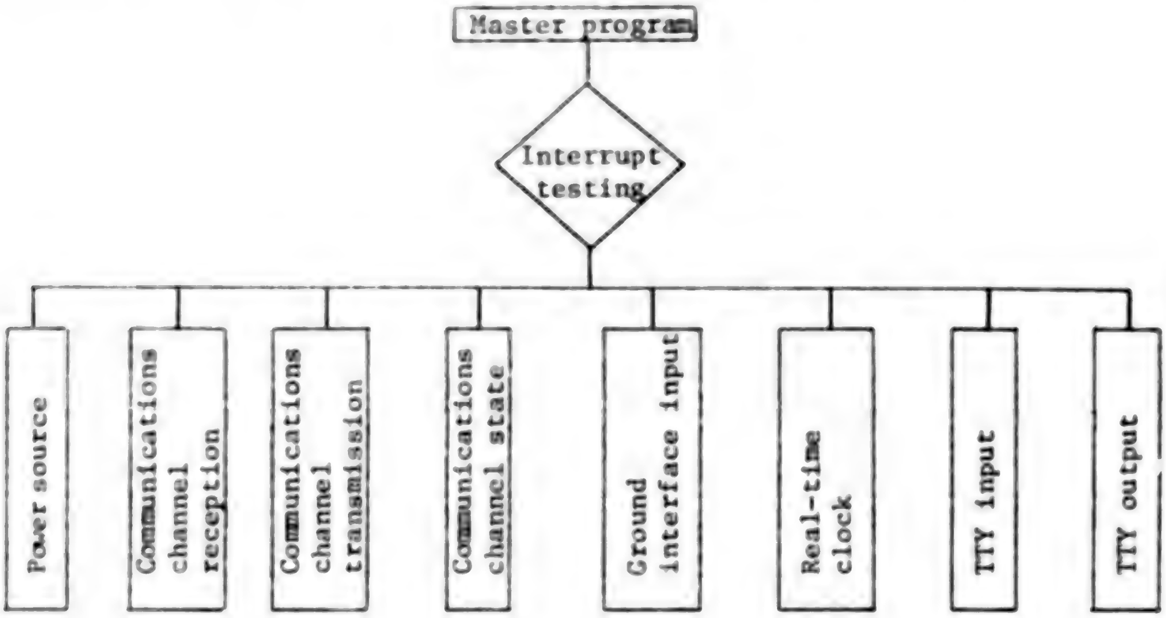


Figure 6

Appendix II: Content of the Interrupt Processing Program for the Common Access Communications Channel During Reception by the Experimental SCPC/DAMA System

Order	Name of Program	Number of programs
1	Common communication channel monitor	224
2	Decoding	160
3	Forward transmission	6
4	Forward dismounting	72
5	Backward dismounting	11
6	Called response	21
7	Testing: "in good condition"	24
8	User busy	6
9	State of satellite circuit	38
10	State of terminal	38
11	Negation	307
12	Recognition	153
13	SSU of SAM	62

[Appendix II continued]

[Appendix II continuation]

Order	Name of Program	Number of Programs
14	Same gun	110
15	Continuity	46
16	IAM	402
17	ISU of SAM	224
	Total	1,904

9296
CSO: 5500/4009

USE OF INTELSAT FOR TV NEWS TRANSMISSION DESCRIBED

Beijing DIANZI SHIJIE [ELECTRONIC WORLD] in Chinese No 10, 1981 pp 5-6

[Article by Yi Shijun [0122 0013 7486]: "How Does the Satellite Receive and Record TV Newscasts"]

[Text] The international news telecasts by the Central Television Station attract viewers from all over the nation. In only about 10 minutes people can see the major events occurring around the world at the time. These international activities seem to happen right next to you, so the newscasts are welcomed by people. Then, how is the news received? To explain this we must talk about the International Telecommunications Satellite Organization.

1. The International Telecommunications Satellite Organization

The international communications satellites used by our nation at present are the fourth generation, transient-type model IV-A, all belonging to the International Telecommunications Satellite Organization (Intelsat Network). The organization was established in August 1964. At first it had a membership of 11 nations and was called the International Telecommunications Satellite Consortium, headquartered in Washington, D.C., in the United States. The satellite organization held a meeting of the signatory member nations every 2 years, to which each government sent delegates. Now the consortium has 105 members, and each year the conference of the signatories is attended by delegates from each nation's telecommunications management departments. Our nation joined the International Telecommunications Satellite Organization officially in 1976.

The goal of the satellite organization is to enable the world's nations to quickly use satellite communications and to establish a single global commercial communications satellite system to expand telecommunications and promote international communication and mutual understanding. At the same time, the organization uses the most advanced technology to provide the most efficient and most economical communications service. It also utilizes radio frequencies most rationally to allow all nations and regions to be connected to the global satellite system, to allow them to invest in that system and to participate in the planning, building and operation of that system.

Up to the end of 1980, the whole world has built 239 ground stations which use the international commercial telecommunications satellites, forming a huge international telecommunications and television transmission system.

II. Present Situation of Satellite Telecommunications

After 1957, when the first artificial earth satellite was successfully launched, each nation's scientists conducted massive experiments to realize satellite telecommunications, and in 1965 the Intelsat-I generation (Early Bird) satellite was placed above the Atlantic and used for commercial telecommunications between Western Europe and North America. At the time, the IS-I only had one 25 MHz bandwidth retransmitter using 4/6 GHz frequencies, and it provided 240 telephone lines and one television channel.

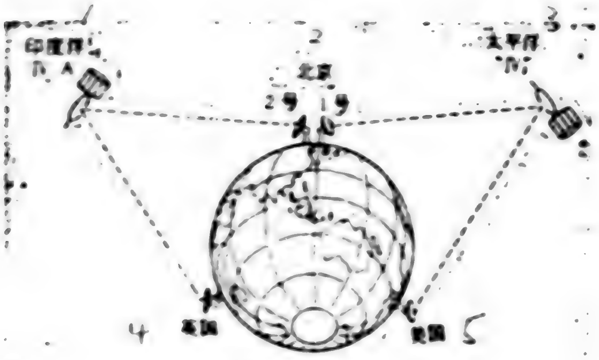
Satellite communication has a large capacity. It can realize multiple access and it is not limited by surface distance and climatic conditions. Except for 20 March and 23 September each year (at which time the sun, the artificial satellite and the earth are in a line) when the sun's interference blocks transmission for a short time, telecommunications can be maintained throughout the year. The average rate of unimpeded communications of the ground stations belonging to the satellite communications organization reaches 99.9 percent. The ground station of our nation has an average rate of unimpeded communications reaching 99.99 percent. The characteristics of this series of communications satellites have enabled satellite communications to develop very quickly. At present, and IS-IV generation satellite is being used over the Pacific, while IS-IV-A satellites are already being used over the Atlantic and the Indian Ocean. Because the IV-A satellite utilizes space separation techniques, besides global beam antennas and spot beam antennas, two hemispherical beam antennas have been added so that the frequencies of several of the 12 retransmitters in various areas can be used twice without interfering with each other. The several other retransmitters are provided for use by global beams. The total capacity of the IV-A satellite is about 6,000 telephone lines (4 KHz per telephone line) and two color television channels (17.5 MHz for each). The telecommunications organization plans to use the V generation satellite over the Atlantic first during the second half of 1981. This satellite uses both the space separation technique and the polarized separation technique and the new frequencies 11/14 GHz. At the same time, it will gradually use digital techniques of the "single carrier wave pulsed code modulated demand assignment multiple access system for each telephone line (SPADE)." For this, each ground station must be rebuilt and equipped with dipolar feed antennas before it can use the V generation satellite. At present, the V generation satellite has already been launched and has been placed in its operating orbit. It is undergoing final performance tests and is being prepared for operation. The V generation satellite will have 12,000 telephone lines and two television channels. The designed life of the satellite is generally 5 to 7 years. This is mainly determined by the solar energy cells and the capacity of the chemical energy fuel cells carried by the satellite.

Everyone knows that the earth rotates on its axis every 24 hours. When an artificial satellite is launched into orbit in the plane of the equator 35,860 kilometers in space, the satellite circles the earth at a velocity of 11,070 kilometers per hour in exactly 24 hours. Thus, when we observe the satellite from one point on earth (of course the satellite cannot be seen by the naked eye or even with a telescope) we can regard the satellite as stationary. This means that the satellite is stationary relative to the earth. If we make the angle of the half power rate of the global beam antenna 17°, then the satellite can cover about one-third the surface of the globe (because the angle of inclination of the antennas of the ground stations cannot be less than 5°, therefore other means of communication must be used to aid telecommunications for regions beyond a definite latitude). According to the distribution of the nations of the world, three satellites appropriately positioned complete a global telecommunications network.

The ground station with the overlapping area of coverage by two satellites (regions of common view) can use two satellites simultaneously. Ground stations not inside the area of common coverage can only use one satellite. China is situated inside the common viewing region between the satellites above the Pacific and the Indian Oceans, so both satellites can be used for telecommunications. At present, the commercial satellites owned by the International Telecommunications Satellite Organization are over the Atlantic (near 325° east longitude), the Indian Ocean (near 62° east longitude), and the Pacific (near 174° east longitude). The largest number of transmissions is via the satellite over the Atlantic, where there are two main satellites (one is the main channel satellite, the other is the large channel satellite) working simultaneously. There is only one main satellite each in operation over the Indian Ocean and the Pacific. In addition, there are also one or two satellites in orbit as backup. Even though the V generation satellite has not begun official operation, concerned departments have already begun to study the VI generation satellite to satisfy the ever increasing needs in the development of international and domestic telecommunications.

III. Reception and Recording of Television News

On 4 April 1980, our nation's Central Television Station and UPITN of the United States and Britain's VISNEWS signed separate 1-year contracts (duration of the contracts has been extended) to receive daily international news via satellite. Reception of transmissions via satellite is performed by the Beijing No 1 and Beijing No 2 ground stations of the Beijing Long Distance Telephone and Telecommunications Bureau.



6 卫星转播示意图

1 Indian Ocean
2 Beijing No 2, Beijing No 1
3 Pacific
4 Britain
5 United States
6 Illustration of satellite retransmissions

From 5:30 to 5:40 am Beijing time, VISNEWS transmits the news it has gathered via various channels in the form of television news from the Mandley(?) ground station in Britain to the satellite over the Indian Ocean (PAL system). The ground stations in certain nations in the Indian Ocean region which have signed contracts with the system receive the transmission. Our nation's Beijing No 2 station receives the transmission from the satellite over the Indian Ocean and uses microwave relay to relay the signals from the satellite to the Beijing Microwave Station in the Long Distance Telephone Building. Here, equipment that receives secondary carrier waves for sound is used to separate the visual frequencies (image) and the sound, then they are transmitted to the Central Television Station for recording. Later, from 6:25 to 6:35 am, the Independent Television News Agency transmits television news from the Jamesberg(?) ground station on the west coast of the United States to the satellite over the Pacific (NTSC system). The Beijing No 1 station receives the television carrier frequencies and converts them first into the PAL system (they can also be converted by the television station), and then the above method is used to send the transmission to the Central Television Station for recording. The Central Television Station processes the two types of news it has recorded, adds explanations and comprehensively compiles the news to become the "international news via satellite" scheduled as an evening television program for telecast via the microwave network to the nation's 26 provinces and cities (Xinjiang, Xizang, Nei Monggol and Taiwan have not been connected). Internationally, transmission via one satellite is called "one-jump transmission." In June 1978, when telecasting the World Cup Football championship game, the transmission was sent by the Vargas(?) ground station in Argentina to the satellite over the Atlantic, received by the Goonhilly Downs Station No 2 in Britain and retransmitted to the satellite over the Indian Ocean and then received by out nation. This transmission via two satellites is called "double-jump transmission."

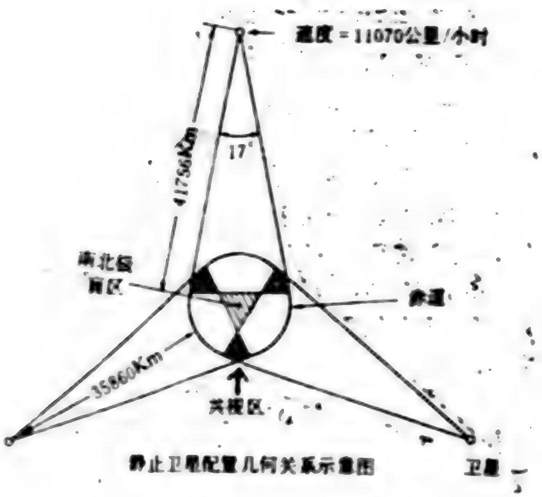
In addition, visits by our nation's leaders, important national events, visits of chiefs of state of friendly nations to our nation and news reports by foreign correspondents are all telecast via satellite by the two ground stations in Beijing. In special situations, the Shanghai ground station is also used for telecasts via the satellite over the Pacific.

A request to use satellites for telecasts must first be submitted to the satellite company. After approval, the satellites can only be used within the time stipulated. For example, on 19 March 1981, when Hong Kong telecast the Asian Preliminaries of the World Cup Men's Volley Ball game between China and South Korea via the satellite over the Indian Ocean, the game was at the most exciting moment when the originally requested time slot ended and transmission to the satellite had to be halted to avoid affecting prescheduled programs of other nations. The prerecorded conclusion of the game had to be telecast the next day.

The transmitting and receiving nations using satellites for television transmissions must pay a fee for the use of the upward channels (transmission) and downward channels (reception) to the satellite company. Because the fee for television channels is expensive, the television transmissions via satellite are mostly news, sports, international conferences and visits by heads of state, and the time is calculated in minutes.

In recent years, the United States, the Soviet Union and Canada have launched their own domestic telecommunications satellites, and Algeria and a dozen or so nations rent some retransmitters of Intelsat to establish their own domestic satellite communications systems.

Since 1972, when our nation began using satellite telecommunications, we have built three ground stations--the Shanghai ground station, the Beijing No 1 station and the Beijing No 2 station--and we have established telecommunications lines of international quality standards with over 20 nations and regions via direct satellite communications or via connections. We have laid the Sino-Japanese ocean cable via Shanghai, and there are also a few shortwave lines that form our nation's international telecommunications network. In order to develop domestic telecommunications, if we could place a domestic telecommunications satellite covering the territory of China and the territorial seas in an appropriate synchronous satellite orbit around the earth for both telecommunications and telecasts, it would be very important for solving domestic communications, especially telecommunications with Xizang and Xinjiang and such border regions, and for receiving programs of the Central Television Station or for exchanging television programs between provinces and between cities.



1 Velocity = 11,070 kilometers/hour
2 South and North Pole blind spot
3 Equator
4 Common viewing area
5 Satellite
6 Illustration of the geometric relationship of positioning the stationary satellites

9296
CSO: 5500/4007

BRIEFS

HEILONGJIANG TV TRANSMISSION LINE--After being checked and accepted by the state, the Beijing-Harbin television microwave transmission line was put into operation on 1 March. The people in Harbin can receive the first program of the central television station through this microwave line. [SK022226 Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 1 Mar 82]

NEW TELEVISION RELAY STATION--Shenyang 15 Mar (XINHUA)--When the curtain was raised on the "all-people civility and courtesy month" on 1 March, a color television relay station began its work to serve some 1,000 households of herdsmen in Horqin grassland who own television sets. The relay station is built by a PLA unit with the joint investment of the people's government of Jarud Banner and the PLA unit stationed there. [OW211251 Beijing XINHUA Domestic Service in Chinese 0232 GMT 15 Mar 82]

CSO: 5500/4012

RADIO RELAY SYSTEMS IN CSSR NETWORK DESCRIBED

Prague TELEKOMUNIKACE in Czech No 1, Jan 82 pp 4-6

[Article by Eng Milos Fiala, Research Institute of Communications, Prague: "Radio Relay Systems in Our Network"]

[Text] Several types of radio relay equipment produced in Czechoslovakia and abroad have been put into operation and tested in the last 10 years. By the end of the last five-year plan, the selection of equipment of this type had stabilized to the point that it is now possible to provide a survey of radio relay systems which have been considered for use in radio relay communications in the Seventh Five-Year Plan and the proposed methods of using them, and to give a brief description of their main technical and operating characteristics. The systems are classified according to their transmission capacities. With the exception of the 11AP32 system, all are analog systems transmitting a frequency-multiplexed signal by frequency-modulated carrier.

The VAM 805 A System

This is a four-channel radio relay system intended primarily for mountain areas where the construction and maintenance of metal cables would be extremely uneconomical. Links are typically 10-15 km long. The equipment operates in the 250 MHz band with a power of 0.5 W and uses a simple Yagi antenna system. It is suited for various types of telephone operations (automatic, manual, two-party terminal operation). The system includes a four-channel frequency division multiplexer. The device has satisfactory transmission characteristics and stability. The reliability is governed by the components used; although it is far inferior to the current worldwide standard, it is adequate for its specific application. The producer, Tesla Prelouc, is preparing a new version of this equipment, the VAM 806, designated for the 400 MHz band, for the Seventh Five-Year Plan.

The 11AP32 System

This radio relay system, with a transmission capacity of 30 telephone channels using PCM [pulse code modulation], is intended for communications in a local network; the length of a link may range from 20 to 35 km depending on the type of antenna used.

This equipment operates in the 11 GHz band with a power of 10 mW; the PCM signal, with a rate of 2,048 Mbit/sec, is transmitted by amplitude-modulated carrier wave. The high-frequency part of the equipment is located in a cylindrical container on the antenna itself. This design allows relatively simple installation on the walls or roofs of buildings or on poles. The system includes a KPR 32 7-bit multiplexer and a power supply, allowing the antenna to be fed by cable at a distance up to 1 km from the multiplexer. The system allows the creation of active and passive relay stations.

The system's transmission characteristics and stability meet technical requirements. The situation is more complex with regard to its reliability, which varies considerably from link to link over an extreme range of two orders of magnitude. The low equipment-reliability results from several simultaneous factors, primarily production, components used, maintenance, availability of spare parts and organization of its operation and maintenance.

The high-frequency part of the equipment is produced by Tesla Hloubetin and the multiplexer to Tesla Strasnice. The 11AP32 system will be modernized in the Seventh Five-Year Plan to increase its reliability and allow it to be combined with the new MPK 32 8-bit multiplexer.

The 8F300 System

The transmission capacity of 300 telephone channels suits this system primarily for use in the long-distance network. A typical link is 50 km long. The equipment operates in the 8GHz band and is provided with an automatic trunk backup system with a maximum capacity of 3+1, allowing measurement of the quality of a given trunk during operation. Switching to the reserve trunk is carried out in the baseband. In addition, it is provided with service connections and with a remote-control system which may be installed separate from the transmission equipment itself. The connection is made with multistrand cable. The service signal, the remote-control signal and the automatic backup signal are transmitted simultaneously with the multiplexed telephone signal, below its lower frequency limit.

Operating tests in 1975 indicated that the equipment had good transmission characteristics and stability. System reliability was also good and was equivalent to the reliability of similar systems imported in about 1972.

There are not yet sufficient data to evaluate the operating tests, since the first link using this equipment was installed during 1980.

Radio Relay Systems From the ORION Company

The Hungarian ORION company is supplying Czechoslovakia with systems having transmission capacities of 300 and 960 telephone channels which also allow transmission of a color television signal with 1 to 4 audio tracks. The equipment is produced in three variants differing primarily in the backup system: the KTF 8000/300 or KTF 8000/960, for telephone transmission only, with a 1+1 backup system; the KTV 8000 model, for television operation only, with a 1+1 backup system; and the GTT 8000/300 and GTT 8000/960, systems for both telephone and television operation, with a 3+1 backup system.

In telephone operation, the equipment is used primarily for the long-distance network, while in television operation it can be used for branches between the main line and television transmitters.

The equipment operates in the 8 GHz band. The 300-channel model has a power of 188 mW with a receiver noise figure of 9.8 dB, while the 960-channel model has a power of 500 mW and a noise figure of 8.3 dB. These figures are calculated for the input and output flanges of the high-frequency frame.

A typical link is 40 km long. The equipment includes an automatic trunk backup system, service communications and a remote-control system which can be installed up to several km from the transmission apparatus itself, connected to the latter by a four-wire cable. Service and auxiliary signals are transmitted in the KTF equipment in the telephone trunk below the baseband. In the GTT and KTV systems, the special DM 8000/S special service communications equipment must be installed; this also operates in the 8GHz band, using delta modulation for signal transmission.

Because of the low transmitter power, the 300-channel version has a TV noise power about three times higher than the CCIR [International Radio Consultative Committee] requirement, so that it is best to limit the use of this system to branches where it will not degrade the overall noise balance of the television transmission network.

The 300-channel systems were introduced into JTS [Joint Telecommunications System] starting in 1972 and the 960-channel systems starting in 1981. The transmission quality and reliability of the 300-channel systems were poor at the beginning of deliveries. The 960-channel system had good transmission quality but poor stability and a high failure rate for certain components. Repeated requests for quality improvement and cooperation with the producer have made it possible to achieve a considerable increase in transmission quality and some increase in the reliability of the 300-channel devices; common causes of breakdowns in the 960-channel system have been eliminated, and transmission stability has improved.

The 8F960/TV System

The 8F960/TV radio relay system was developed by Tesla Hloubetin during the Sixth Five-Year Plan, and operating tests were completed in January 1981. The equipment is intended for transmission of 960 telephone channels or a color television signal with 1 to 4 audio tracks. It is planned for use in the construction of a long-distance system and branch TV links.

The system operates in the 8 GHz band. A typical link is 50 km long. The transmission equipment is provided with a 3+1 automatic trunk backup system and 1+1 modem backup. Both systems allow measurement of the quality of a selected trunk during operation. Service conversations and auxiliary signals are transmitted in a telephone trunk below the lower frequency limit of the baseband. It is proposed to use the VAM805A equipment exclusively for television communications.

The control unit of the remote-control system is a small independent computer which allows use of the optimal number of control signals and station control by means of program adjustment. In addition, it can be connected to various peripherals which indicate the status of the equipment being monitored, including a teletypewriter which can constantly record all commands and reports passing through the station.

Operating tests indicate good transmission characteristics and stability but low reliability of the basic functional components. Production of the equipment is planned for the Seventh Five-Year Plan.

The GTT70 System

The Hungarian FMV Co produces the GTT70 systems, with a transmission capacity of 1,800 television channels, allowing transmission of a color television signal with 1 to 4 audio tracks. The system operates in the 4 GHz band (GTT 70 4000/1920) or the 6 GHz band (GTT 70 6000/1920). The systems are intended for construction of an intertrunk telephone network and for television links. A typical link is 46 km long.

The equipment is provided with a 7+1 or 6+2 automatic backup system and with automatic substitution of modems. Service conversations and auxiliary signals are transmitted in a telephone trunk below the lower limit of the baseband. The remote control system is of the usual type.

All of the equipment is transistor-based with the exception of the transmitter final stage, which uses a traveling-wave tube. This results in a higher consumption of electric power than present-day fully transistorized systems. The equipment can also be used effectively for the transmission of 960 telephone channels. In this case the power of the traveling-wave tube is decreased to half the rated value.

The organization of service communications and automatic backup does not allow the construction of links in which the backup sections of the telephone trunks are in the medium frequency range, since it is necessary to demodulate to the baseband.

Czechoslovakia has tested the model with a transmission capacity of 960 telephone channels operating in the 6 GHz band. These tests indicated extremely good transmission characteristics and stability. The weak point of this system, however, was its reliability, which is much lower than the current worldwide state of the art.

Radio Relay Systems From the NEC Company

The Japanese NEC Co is supplying Czechoslovakia with systems with a transmission capacity of 1,800 telephone channels, allowing transmission of a color television signal with 1 to 4 audio tracks. The system operates in the 4 GHz (TR 4G 1800) and 6 GHz (TR 6G 1800) bands and is intended for the construction of intertrunk telephone networks and television links.

The system allows 7+1 trunk backup with a modem substitution capability. The remote signaling system is of the usual design and can be supplemented with a remote-control system, which is not currently used in Czechoslovakia. Service conversations and auxiliary signals are transmitted below the base frequency of the telephone trunk.

The modular design permits great design flexibility of both the transmission equipment itself and of the auxiliary systems, particularly the automatic backup systems.

The producer supplies 4-GHz band transmitters with powers of 5, 3 and 1 W and 6 GHz transmitters with powers of 4, 2 and 0.5 W. The receivers have noise figures of 4.5 or 6.5 dB. This fact, combined with the wide selection of antenna systems, allows the designer to select the optimal variant in terms of the radio-electric ratios on the link and the selected transmission capacity.

Operating tests indicate that both types have extremely good transmission characteristics and good stability. Overall system reliability is also good, being at the level of current worldwide standards. The good reliability allows use of the reserve trunk for special signal transmission.

* * *

All of the systems described above meet requirements for transmission signal quality. The quality requirements are based primarily on specifications of CCIR, CCITT [Consultative Committee for International Telephony and Telegraphy], OIRT [International Radio and Television Organization], the Guidelines for Construction of Telecommunications Networks, and Czechoslovak state or sectorial standards. The situation as regards the evaluation of equipment reliability is less favorable. While it has gradually become possible to take it for granted that the requirements for quality of television transmission characteristics will be met in the case of most producers, the failure rate has become one of the most important criteria for evaluating system characteristics, the failure rate directly affects operating economics. It governs the requirements for numbers of maintenance personnel, number of vehicles, fuel consumption, qualities of spare parts and components, and equally important, the number of measuring devices.

One criterion of equipment reliability is the mean time between failures (MTBF), which is determined for the main functional components (transmitter-receiver, modem, automatic backup equipment, service link, remote control equipment, sound modem and the like) of each system. The table given below surveys MTBF for the transmitter-receiver combination of various types of radio relay systems. The values for equipment which has not been in every day operation were determined from short-term monitoring during operating tests. The table also gives data for transistorized equipment which will be in operation in the Seventh Five-Year Plan, but in most cases its wider use is not planned.

Mean Time Between Failures of Transmitter-Receiver Combinations of Systems Operating in the Czechoslovak Network

Equipment type	MTBF (hours)
VAM 805A	12,000
11AP32	8,000
8F300	35,000
ORION 300	7,500 - 10,000
ORION 960	→ 5,500 - 9,500
8F960/TV	6,700
TR7G960	70,000
FV23	25,000
FV41	32,000
GTT 70	→ 9,200
TR 4G 1800	98,000
TR 6G 1800	122,000

8480
CSO: 5500/3007

COLOMBIAN, BRAZILIAN COMMUNICATIONS AGREEMENT

Bogota EL TIEMPO in Spanish 3 Mar 82 p 18-A

[Text] Yesterday Colombia and Brazil agreed to put into effect a far-reaching binational program of cooperation in the fields of telecommunications and postal service.

The agreement was signed by the minister of communications of Colombia, Antonio Abello Roca, and of Brazil, Haroldo Correa De Mattos.

Minister Abello Roca said that the agreement covers counseling on the training of personnel in postal services, national communications by satellite, transmission of data and technical and operational systems.

He said, "This is one of the concrete results of the broad agreement on technical cooperation between the two countries which President Julio Cesar Turbay Ayala obtained in September 1981 during his visits to Brasilia and Sao Paulo."

He added, "In due course the agencies which will be responsible for carrying out the specific programs will be designated through diplomatic channels."

Under the terms of the agreement, there will be exchanges of experience by specialized technical missions and specialized courses and on-the-job training will be provided in various branches of telecommunications and postal service such as the following:

Urban and rural telephone service requirements, counseling on training personnel in postal services, national communications by satellite, transmission of data, planning and control, operational planning and supervision of the installation of systems, counseling on the regulation of broadcasting systems, installation of TV retransmission and repeater systems.

Stimulus to Communication

The joint participation of Brazilian and Colombian enterprises will be coordinated by the respective ministries of the two nations. In Colombia, Telecom, Inravision and the National Postal Administration will take part.

Minister Antonio Bello Roca said, "The technical services provided will be in the telecommunications and postal fields mentioned, but the relationship can be modified at the option of the parties through correspondence between the two ministries."

He added, "The expenses of the missions, international travel, exchange of specialists and technicians, the rendering of services, the supply of specialized materials and equipment as well as financial assistance, salaries, social benefits, medical and hospital care will be shared by the two ministries.

The minister said that both countries agree not to give third parties access to documents sent to them in implementation of the agreement by mutual consent. He explained, "The agreement goes into effect immediately for 3 years and then will be renewed automatically for a year at a time unless one of the parties gives notice through diplomatic channels that is wishes to end it."

Abello Roca said that the termination, however, would not affect projects already in operation unless the parties come to an agreement to that effect.

9204
CSO: 5500/2149

BRIEFS

SOVIET FILM EXCHANGE AGREEMENT--Mexico City, 23 Mar (NOTIMEX)--Mexico and the Soviet Union signed a film exchange agreement today providing for the coproduction of several films. This was reported at a meeting between the general director for radio, television and films, Margarita Lopez Portillo, and the chairman of the Soviet State Committee for Cinematography, Filipp Yermash. Also taking part in the meeting were (Aleksey Rastorov), director of Soveksportfilm; (Gennadiy Kononenko), chief of the Mosfilm Studios' international relations department; and cameraman (Vladimir Yusov). [FL241507 Mexico City NOTIMEX in Spanish 0340 GMT 24 Mar 82 FL]

CSO: 5500/2174

BRIEFS

PROGRAMMABLE TELEX COMMUNICATIONS CONTROLLERS--Haifa--Computer data can now be transmitted over telex lines with the help of the programmable telex communications controller (PTCC) developed by Sintel Systems Ltd. Conversely, computers equipped with a PTCC unit will be able to receive and interpret data sent to them over telex lines. This development is potentially very important since it gives electronic data processing equipment access to a reliable and widespread means of international communication. Sintel's PTCC is based on the 8085 microprocessor. Host computer commands will activate it in one of four different modes to handle incoming or outgoing calls or both, and also to engage in the give and take of "conversation." Messages received and to be sent are translated from ASCII to Baudot--the languages "understood" by computers and telex systems, respectively--and vice versa, stored in a special message buffer and then sent to their various destinations when protocol conditions so determine. The Sintel unit handles all telex line functions, such as dialing, current monitoring, answer back checking and so forth. Data are transfered to the telex line at the rate of 50bps. As many telex lines as desired can be connected to a single computer, using a Sintel PTCC for each such line. The controller is supplied as a rack mounted unit, which can hold up to twelve PTCC cards. Connectors are provided for connection to the host computer, to telex lines and to the power supply. [Text] [Jerusalem INNOVATION in English No 75 Feb 82 p 4]

MULTI-CHANNEL FIBEROPTIC CABLES--The Electric Wire & Cable Co (EWC), Israel's leading manufacturer of wire and cables and Fibronics Ltd, producers of fibers and mini-cables, are jointly undertaking to manufacture multi-channel fiberoptic cables for long-distance, high-speed telecommunication. EWC will provide the fiberoptic cabling suitable for telephone and cable TV trunking and interbuilding data communications which can be placed in air or ground environments. Cable options include a metal or nonmetallic strengthening member, an aluminum foil jelly-filled moisture barrier and insulated copper conductors upon request. Fibronics' optical fibers ensure the user of superior optical performance along with structural strength, low loss and high bandwidth. In addition, Fibronics is providing individual strain-relieved, color-coded subchannels to manufacture a variety of fiberoptic cable types. [Text] [Jerusalem THE ISRAEL ECONOMIST in English Vol 38 Jan 82 p 21]

CSO: 5500/4713

BRIEFS

ELECTRONIC SWITCHBOARD PRODUCTION--The Syrian firm for manufacturing and marketing telecommunications equipment, (Syrcotel), began production on 23 February of electronic telephone switchboards. The company's peak production will reach 50,000 telephone lines annually. The company is owned in part by the Syrian public sector and in part by the French firm, CIT Alcatel, which supplies the Syrian company with complete equipment and industrial machinery, which is set up with technical assistance from the French firm. The company will supply a large portion of Syria's need for electronic telephone exchanges and telephone lines, and its manufacturing facility may be upgraded in the future to increase productive capacity. [Text] [Paris AL-MUSTAQBAL in Arabic No 263, 6 Mar 82 p 46]

CSO: 5500/4712

GENERAL ECONOMY, TELECOMMUNICATION PROJECTS REVIEWED

Paris REVUE FRANCAISE DES TELECOMMUNICATIONS in French Jan 82 p 56

[Text] A centralized republic, Tunisia has a surface area of 164,000 square kilometers (about one-third the size of France). The population is approximately 6.6 million, of which more than 1 million live in Tunis, the capital city.

The per capita GNP [Gross National Product] grew by 5.7 percent in real terms between 1970 and 1978. Leaving aside the oil-producing nations, the Tunisians enjoy one of the highest per capita GNP's in the Third World: in 1977 the average annual income of a Tunisian family amounted to $3,000, and it was $2,000 in the rest of the country.

The agricultural sector employs close to half the working population, accounts for 21 percent of the GDP [Gross Domestic Product] and in 1978 provided 21.3 percent of export earnings.

As a result of increases in the price of phosphates and oil, the extractive industries have risen in importance in the Tunisian economy. In 1979 France remained Tunisia's number one supplier and second largest customer.

Posts and Telecommunications [PTT], which is under the Ministry of Transport and Communications, enjoys a complete monopoly on services. Since 1976 companies in the private sector have had the right to install private automatic switchboards approved by PTT.

The telephone system has 120,000 subscribers at present, which for a population of around 6.6 million yields a density of 1.8 lines per 100 inhabitants; that is the highest density anywhere in the Maghreb.

In summer, because of the prevalence of the uninterrupted workday (0700 hours to 1300 hours) and the influx of foreign tourists, the system becomes overloaded in the mornings, causing a serious deterioration in the quality of service. In this regard, a preferential rate is being introduced to provide an incentive for users to call during off-peak hours.

The waiting list is growing faster than the increase in the number of primary lines (this phenomenon might be considered a sign of the good health of telecommunications!); the waiting list was equal to about 40 percent of primary lines in 1977 (24 percent in 1974 and 5 percent in 1968). The objective is to reach a point where the waiting list is equal to no more than 25 percent of the number of primary lines. To do that, the Tunisian PTT intends to have 200,000 primary lines connected by 1985 and 400,000 by 1980 [sic]. This growth is a good reflection of overall economic expansion, but Tunisia's announced telecommunications development objective still seems inadequate to the needs of an expanding economy.

Between 1977 and 1981 the number of lines grew at an average rate of around 13 percent per year, compared to the 7 percent annual growth during the 1972-77 period.

In September 1980 CIT-Alcatel was awarded a contract worth Fr 119 million to provide 60,000 E 10B-system lines for the Sfax Sousse and Gabes telephone exchanges. LM Ericsson, which previously held a near-monopoly on switching equipment, is getting a large piece of the action itself: 70,000 new AXE temporal lines and 40,000 extension lines.

As a part of the switching equipment modernization, an international call for bids was made in late 1980 for the provision of interexchange connecting equipment that uses digital technology. A French consortium led by CIT-Alcatel and including Cables of Lyon, SAT [Anonymous Association of Telecommunications] and TRT [Telecommunications Radio-engineering, Telephone] has already grabbed a large share of this market. Negotiations are under way for the completion of this equipment project.

Communications between France and Tunisia are channeled through two undersea cables which provide a total of 349 circuits in both directions. A third cable going from Marseille to Bizerte should be on line in 1982. The Tunisian Undersea Cable Telecommunications Company, established as a joint venture in which the State of Tunisia and France Cables and Radio hold equal shares, will control this cable, which is primarily intended for communications between Tunisia and Europe.

A call for bids was made in 1980 for the provision and installation of an A-class ground station: the contract went to NEC.

At this time Franco-Tunisian cooperation is on the upswing: a number of steps have been taken toward bringing about (among other things) the introduction of the temporal switching system into the Tunisian network. Tunisia, which is making a major effort to improve its telecommunications, should have a modern network that offers users satisfactory service within a few years.

9516
CSO: 5500/5008

BRIEFS

ENGLISH CHANNEL FOR SBS--The Swaziland Broadcasting Service is to build a medium-wave transmission station near Sidvokodvo in the near future. This was disclosed by Deputy Prime Minister, Senator Ben Nsibandze recently. The station will transmit in English. The effect of this will be a wider range of coverage by SBS's MW service. It is understood that the transmitters will be the highest in the country. An informed SBS source said it will be more than double the height of the present FM transmitters at Malagwane hill in Mbabane which are about 60 metres long. [Text] [Mbabane THE TIMES OF SWAZILAND in English 19 Mar 82 p 3]

SWAZI LANGUAGE RADIO--The South African Broadcasting Corporation has announced in Johannesburg that a new service, Radio Swazi, is to start broadcasting on 1 April. It is almost 22 years since the introduction of radio services in black languages in June 1960. The new service will take its place alongside the existing seven radio services for the black peoples of South Africa. Figures reveal that the radio listenership in the languages of the black people in South Africa has increased considerably during the past 22 years. Independent research shows that these services presently have an adult listenership audience of about 5.5 million. [Text] [LD230612 Johannesburg International Service in English 2100 GMT 22 Mar 82 LD]

CSO: 5500/5737

MAEDA EXPLAINS DELAY IN COMPLETION OF PANAFTEL SECTION

Dar es Salaam DAILY NEWS in English 11 Mar 82 p 1

[Text] SEVERAL factors, including lack of foreign exchange and building materials, delayed the completion of the Tanzania section of a Pan-African Telecommunication (PANAFTEL) network aimed at establishing direct telephone links between Tanzania, Kenya, Zambia and Malawi.

The Director General of the Tanzania Posts and Telecommunications Corporation, Ndugu J. W. Maeda, told *Shihata* in Dar es Salaam yesterday that the delay of the 43million/- project was also due to fuel shortage and inadequate transportation facilities, especially in up-country areas.

Ndugu Maeda said construction of tower bases for the network in the Tanzania section was badly affected, particularly in the Chalitumbi and Tunduma areas.

Panaftel network in Tanzania is being established with Japanese assistance. It aims at providing direct telephone link to other African countries without going through those outside the continent.

Ndugu Maeda said congestion between Dar es Salaam and Mbeya lines had now been reduced following the completion of the Dodoma-Mbeya section of the network last year.

In Tanzania, he said, the network was divided into three sections. The first is the Moshi-Mbeya-Tunduma to Zambia and the last between Dodoma and Arusha.

He said with the exception of the Dodoma-Arusha part, expected to become operational next month, the other sections have already been completed.

On the installation of multiplex exchanges and engines at Dodoma, Tabora and Mwanza, Ndugu Maeda said an exchange with a capacity of 1800 lines worth 7,140,000/- had been ordered from abroad for Tabora.

A 14million/- building to house the exchange is under construction and is expected to be completed by mid-next year.

Installation of the machinery would start later in December the same year with the station becoming operational by August 1984.

On Mwanza, Ndugu Maeda said the town had 2,000 lines and that plans were underway to provide an additional 2,000 lines. Expansion work was scheduled to start by December in 1983 and would be completed in August 1984.

Dodoma, he said, now has new exchange with 3,000 lines which sufficiently caters for the town.

The installation of ultra high frequency system (UHF) for Lindi, Mtwara, Newala, Masasi, Songea, Tunduru, Mafia, Kisarawe, Singida and Kiomboi was progressing well, he said.

Also work on the 25million/- World Bank-financed project between Mtwara-Lindi, Singida—Kiomboi and Dar es Salaam-Mafia had been completed while installations at the Mtwara-Newala-Masasi, Songea-Tunduru and Arusha-Karatu-Babati-Mbulu sections were in the advanced stage. The project is scheduled to be completed by the end of this year.

CSO: 5500/5740

OTS SATELLITE TO TEST DIGITAL SOUND TRANSMISSION

Stockholm NY TEKNIK in Swedish 4 Feb 82 pp 16-17

[Article by Eva Olsson: "Satellite Test in Spring with Digital Sound"]

> [Text] Digital sound transmission will probably be a reality in the TV satellites of the European countries. The advantages are better sound quality and better utilization of the satellite channel space. Digital sound systems are being investigated in Sweden, Norway, England, France and West Germany, among others. In the spring the first tests with digital modulated sound will be conducted over the European Telecommunication Administration experimental satellite OTS.

There are a number of advantages in sending digital sound over today's method with analog sound. Digital modulated sound signals can be sent through space in the form of a pulse train. The pulse train is less sensitive to interference than analog modulated sound waves (FM or AM).

No fading or noise occurs. Dynamic volume increases and distortion decreases.

It is practical to transmit digital sound by satellite. There is only one transmitter which must be tuned instead of several on the ground. In any case, the consumers will need to obtain new satellite receivers.

Digital modulation makes it possible for satellite channels to be utilized better than if the sound is analog modulated. Up to six digital radio programs can be sent at once, in addition to a TV picture and sound, on one satellite channel. If the programs are sent in stereo, the numbers are halved.

There has been no political decision about digital sound on Nordsat. The technical aspects are being investigated in Sweden by the radio laboratory of the Telecommunication Administration, and by the Research and Development Division of Swedish Radio.

"The Swedish work began last year," said Kjell Engstrom of Swedish Radio. "Therefore we are still involved in research."

Digital Radio Exists

"We have directed our efforts in three ways, namely: digital sound in general, different methods of coding sound to a binary code (ones and zeros) and new methods of modulation for digital TV sound."

Similar research work is going on in several European countries, including England, West Germany, France and Norway. England has had grounded digital radio links since 1972. In Norway they are now building such a system.

In 1977 a frequency conference (WARC) was held in Geneva. The European countries were then each assigned a satellite place in a geostationary position over the equator. Each country can itself decide how the channels in the satellite should be used--if for example they wanted to use them just for radio transmission.

No unified modulation method for digital sound was adopted at the conference. The result has been that the countries work with different digital (and analog) systems. Attempts at standardization were made by international organizations for the radio, TV and telecommunication administrations of the different countries.

The recommendations with the most impact are those made by the CCIR (International Consultative Committee on Radio Transmissions). It is a worldwide organization for coordination and cooperation between the telecommunication administrations of the various countries. Even the East participates.

CCIR submits its recommendations in detail. There will be no recommendation for sound transmissions before 1983.

"Then we can expect that it will take 3 years before the manufacturers produce prototypes of receiving equipment," said Kjell Engstrom.

"The equipment must be completed when the satellites are sent up in 1985-86. Then it would only be necessary to count backwards..."

If digital sound is not developed in the same way, different countries will not be able to listen to each other's transmissions unless the home receivers are doubled. And that would be unreasonably expensive for the average man. Furthermore the sound would have to be converted at the national borders.

But it is not certain that there will be agreement on whether digital sound will be transmitted.

Agreement Must Be Reached

"If CCIR can not decide in time, the standardization work will go over to the German so-called two-tone system with analog modulation," said Kjell Engstrom.

In West Germany they have begun to send TV sound in stereo. The sound is distributed by a grounded system with analog modulation.

"West Germany is planning on analog modulation for satellite distribution also," said Kjell Engstrom. "That is for industrial-political reasons. Then they can quickly begin to manufacture receivers, and production is maintained. To reach agreement on the formation of a digital system will take time."

In the Spring

The first attempt with digital sound transmission via satellite will be conducted in the spring of 1982 through the European Telecommunication Administration's experimental satellite OTS. Sweden will also experiment with a digital sound system over Tele-X when it is sent up in 1986.

In order to receive radio and TV transmissions from a satellite one must have a parabolic antenna. In the antenna there is a converter from 12 GHz (the current frequency band within the microwave area) to about 1 GHz. Furthermore an in-house unit is needed which can reproduce a normal TV signal or decode the digital modulated sound.

According to the receiver industry the antenna plus the converter should not cost more than half of a color TV. Today it costs 3000 kronor.

The programs can also be received by a central antenna.

It will be possible to listen to both TV sound and radio sound from the TV speaker. But it will not be possible to use today's TV set to receive sound which is transmitted in digital form. The TV must have a contact on the back to connect a decoder.

The only country which has prepared itself for digital sound is France. There all new TV sets must have such a contact. In the future the in-house unit and decoder will be built into the TV set.

The best sound, however, comes from connecting the sound signal directly to the amplifier portion of a hi-fi installation. That assumes that it has its own antenna.

"We are investigating what digital receiving equipment will look like," said Kjell Engstrom. "Together with the Telecommunication Administration we will construct different systems to test digital receivers."

The receiver industry--Philips, Luxor and others--have so far been rather cool toward the digital side. At least publicly.

If we get digital sound by satellite, will the TV picture also be digital?

"In the 1990's at the earliest," said Kjell Engstrom.

Sweden--and most other countries--are working on a TV sound system which assumes that the picture is analog. Only Norway is working with a system which will include a digital TV picture.

"Gradually we will perhaps get a whole new TV system with better resolution," said Kjell Engstrom.

"Today there is already a completed system in the laboratory with over 1200 lines instead of today's 625. The quality is comparable to a color slide! But it is unreasonably expensive now."

9287
CSO: 5500/2165

NORDIC COUNCIL DEBATES SATELLITE

Stockholm DAGENS NYHETER in Swedish 4 Mar 82 p 6

/Text/ Helsinki, Wednesday--On Wednesday the governments of Sweden, Norway, Iceland and Finland were given the task by the Nordic Council of initiating the so-called study phase in the Nordic cooperation to broadcast Nordic television and radio programs via satellite by the end of the 1980's.

This took place after a brief but intense debate with lively participation by Nordsat's toughest opponents and its most eager advocates.

"Nordsat lives," rejoiced Hakon Randal of the Norwegian Conservative Party.

"It isn't Nordsat at all we are talking about any longer, only Nordic television cooperation via satellite," retorted Sture Palm, Swedish Social Democrat.

Gabriel Romanus (Liberal Party) spoke warmly in favor of the Swedish industrial-political interests. He emphasized the opportunities for simultaneous export of the new satellite technology now made possible by the decision.

Finnish communist Arvo Kemppainen scolded Romanus for doing nothing but reading the names of favorably placed Swedish companies. The Finnish communists, just as the Swedish ones, so far have not had much good to say about the future television-satellite cooperation.

Gunnel Jonang, a member of the Swedish Center Party, who just as the Social Democrats had to give up her doubts about the project, made a lively presentation with emphasis on all of her critical viewpoints. One must think of the increasingly passive attitude of television-watching children and not only in industry-political terms, she said.

It is no longer the gigantic 10-channel Nordsat project that is the subject of discussion, but a slimmed-down version. The new project will also soon get a new name.

11949
CSO: 5500/2143

BRIEFS

BIGFON IN BERLIN, STUTTGART--Within the scope of plans for BIGFON--the broadband, integrated glass-fiber telecommunications network--the German Federal Post Office awarded SEL a contract for construction of prototype systems in Berlin and Stuttgart. SEL's system concept provides fully digital transmission of narrow band (telephone, CRT text, Telex, Telefax and data) and also broad band service (picture telephone, data, video and stereo radio channels) in both directions over a single fiber per customer. Delivery of the prototype systems to the Federal Post Office is planned for the end of 1983 or the beginning of 1984. [Text] [Wuerzburg ELEKTROTECHNIK in German 21 Dec 81 p 6] 9160

CSO: 5500/2139

FRANCE

BRIEFS

INTELSAT ORDERS ARIANE LAUNCHES--Intelsat [International Telecommunications Satellite Organization] recently placed two new orders with Arianespace for Ariane launches. These contracts totaling approximately $100 million cover the launch of two Intelsat 5A satellites in 1985, thus bringing to five the number of firm Intelsat orders received by Arianspace. Even though these recent orders had been expected ever since the Ariane launch vehicle completed its qualification test flights, they have further enhanced the launcher's credibility and raised to 27 the total number of manifested Ariane-launch payloads. In addition, Sweden has just signed a reservation agreement for launch of its Tele-X direct TV broadcast satellite in 1986. Negotiations are underway with several American firms, including RCA, and with Canada which is beginning to have misgivings about inordinate delays in the U.S. space shuttle that is scheduled to launch Canadian Anik satellites. Talks are also being held with India and Brazil among others. [Text] [Paris ELECTRONIQUE ACTUALITES in French 26 Feb 82 p 10] 8041

THOMSON-CSF DEVELOPS TWT--Thomson-CSF is developing a traveling-wave tube (TWT), designated TH3660, for communications and direct broadcast satellites. This TWT supplies more than 30 watts of saturated output power and operates in the 12.5-12.75 GHz band. [Text] [Paris ELECTRONIQUE ACTUALITES in French 26 Feb 82 p 13] 8041

CSO: 5500/2163

PAPER COMMENTS ON NORDIC COUNCIL DEBATE ON NORDSAT

/Editorial by Olof Kleberg/

/Text/ Nordsat is dead, long live Nordsat--this was the message of Wednesday's debate by the Nordic Council over Nordic radio, television and telecommunication cooperation.

The old idea of a satellite capable of transmitting all the Nordic channels is dead. A slimmed-down version, proposed by the Nordic Council of Ministers last fall, was rejected by Denmark. There, one believes it will be cheaper to expand the second television channel with ground technology. And one is furthermore quite indifferent: Most Danes watch so many television programs in Swedish, Norwegian and German anyway.

But the governments of the other four countries will now continue the preliminary work for a satellite, perhaps connected to the Swedish experimental satellite Tele-X. Former critics within the Nordic Council, two Center Party members from Sweden and a member of the People's Democrats from Finland changed their minds at the last minute.

The cultural-political objections against a torrent of conventional and non-Nordic programs remain. The opportunity of really limiting this flow in favor of Nordic programs and programs for minority groups will be decisive for the evaluation of the new model.

11949
CSO: 5500/2143

NEW TELEMATIC SERVICES TO BE INTRODUCED

Paris AFP SCIENCES in French 28 Jan 82 p 25

[Unsigned article: "Switzerland and Telematics in the Year 2000"]

[Text] Bern--The Swiss PTT has perfected new services to meet the needs of telematics for the year 2000, in a country where the installation of computers has gone from 170 to 3000 in 12 years.

The latest in the technology: Videotex, Teletex, Telepac, and Sam, were presented to the press last week, before being offered to actual or potential PTT customers.

By means of a telephone and a television receiver, Videotex makes it possible to have access to a data bank which contains a great variety of information, from weather predictions to the schedules of planes leaving Geneva, and including stock market quotations. This system should be operating in 1985.

Teletex is designed to speed up the transmission of current Telex services. This device, which will be 50 times as fast as the conventional Telex, should be operating in 1983.

Telepac is a new process which by the middle of 1982 will allow a sender to transmit information to an addressee by packets, as in the case of packages, thus avoiding the monopolizing of a telephone or Telex line.

Finally, the Sam system allows a sender to entrust a telephone switchboard with the sending of messages of any type to an unlimited number of parties. This system has been operating since 1979.

In summary, the circulation of data among computers and terminals, provided by the telecommunications network, should have about 40,000 data stations linked to it by 1985.

Investments in the telematics sector which amount to 80 million Swiss francs per year, are thus expected to increase during the coming years.

At the same time, PTT plans to actively participate in the development of an international communications system using satellites, which will enable an expansion of long-distance information transmission capabilities to take place.

11023
CSO: 5500/2150

BRIEFS

LONGEST FIBEROPTIC CONNECTION--In November, British Telecom will commence laying a glass-fiber cable about 190 km long between London and Birmingham. The new cable will go into operation in the summer of 1982 and will be the longest glass-fiber link installed anywhere in the world up to that time. In the 1980's, British Telecom will install at least 100,000 km of glass-fiber cable to produce a network linking all large British cities. The London to Birmingham cable will use light-emitting diodes instead of lasers as a source of light. [Text] [Wuerzburg ELEKTROTECHNIK in German 6 Nov 81 p 6] 9160

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